Chemical Week

October 23, 1954 Price 35 cents

Are you hedged against product liability lawsuits? Awards are getting costlier, commoner . p. 20

Target: a no-shrink, no-swell wood; behind the door: a $123-million chemical market . . . . . p. 44

The wraps are partly off the AEC's processing of uranium; here's what can be told . . p. 50

Colgate teams up with Rutgers to exploit isotopes as tooth-decay tracers . . . . . p. 76

Nylon picture will be retinted as caprolactam heads for large-scale output . . . 95

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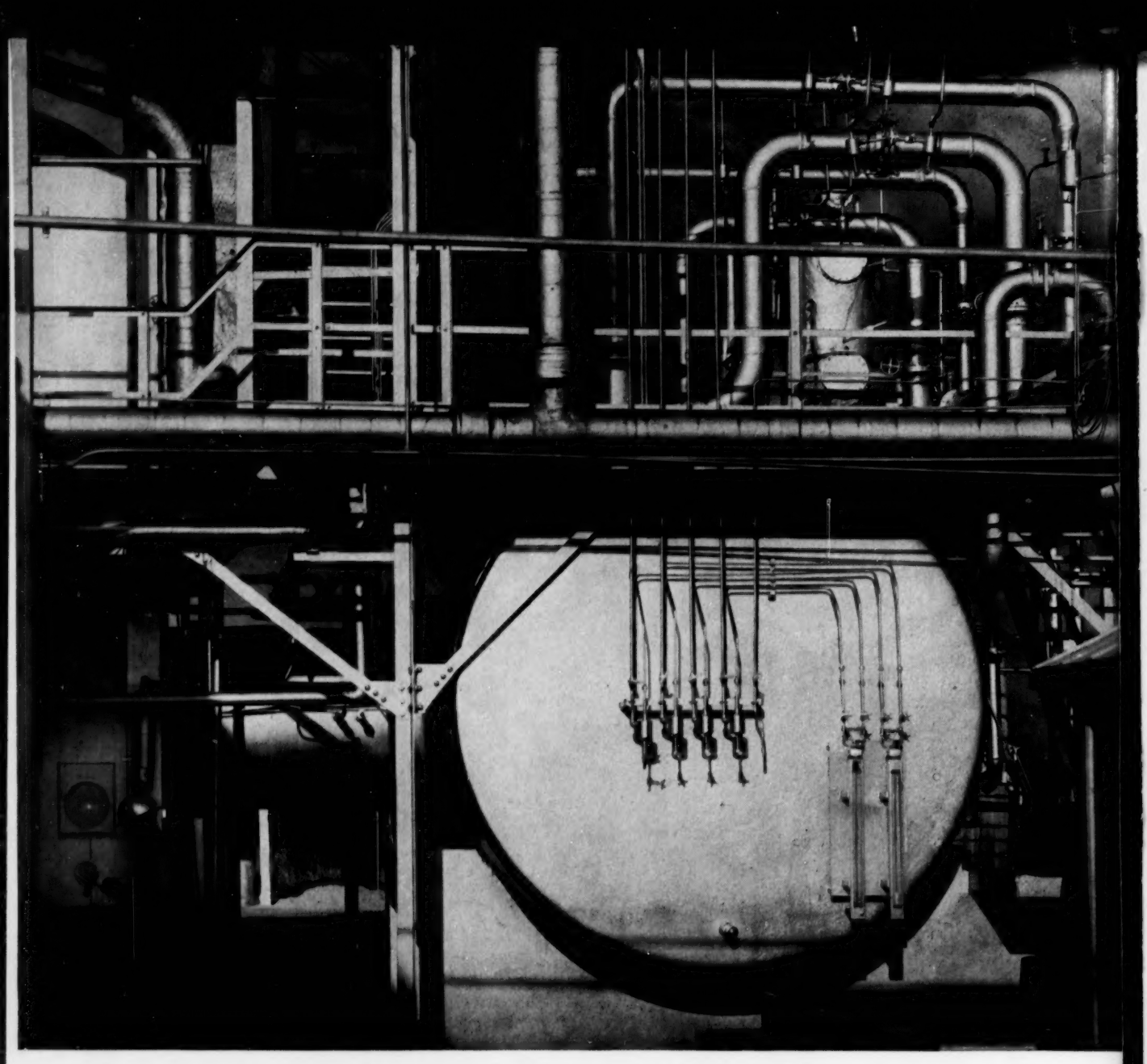

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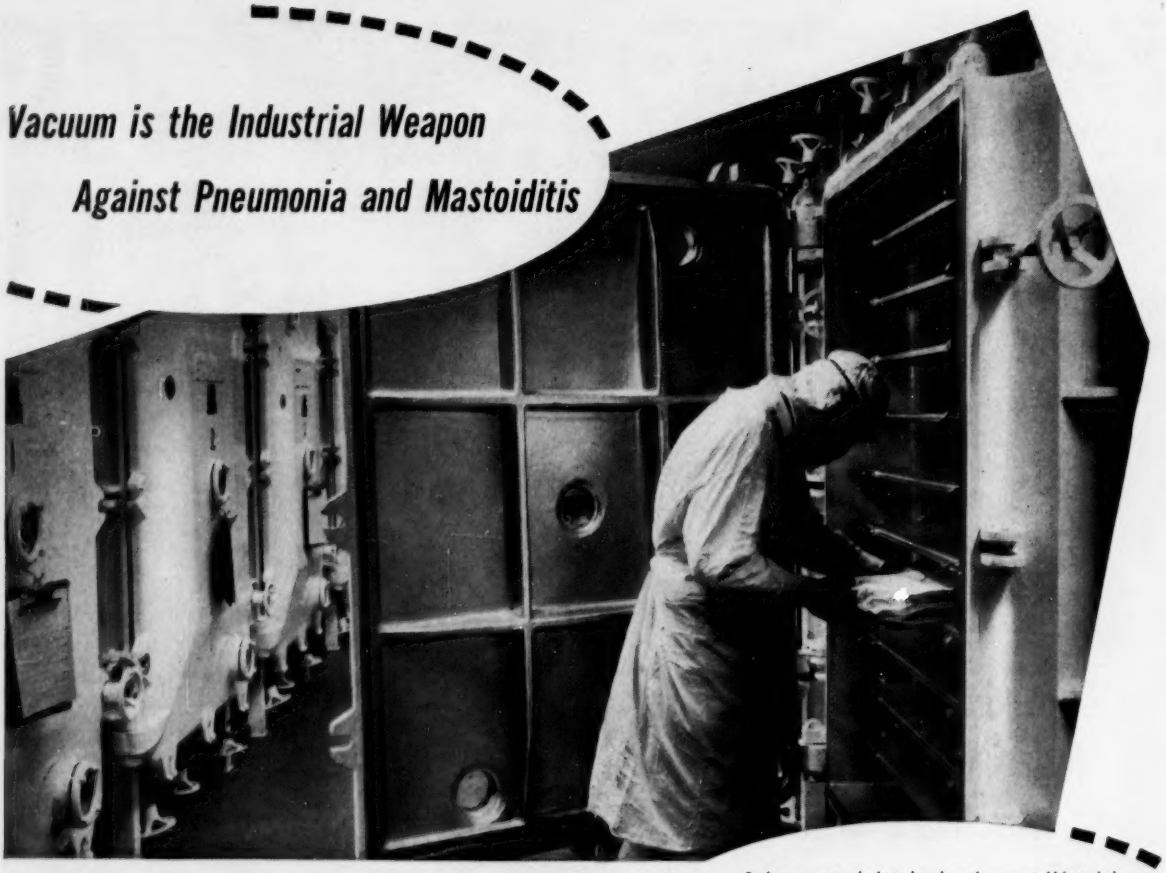

Stokes vacuum drying chambers in use at Abbott Laboratories, North Chicago, Ill., for the drying of crystalline penicillin and other antibiotics. Picture is taken through window of sterile drying room. Operator is masked and gloved to maintain sterile conditions.

Remember when these were dreaded afflictions? Now mastoid troubles are a rarity and pneumonia is no longer a dreaded killer, thanks to penicillin. Penicillin, dried in Stokes vacuum chambers at Abbott Laboratories, North Chicago, Ill., is one of many pharmaceuticals which must be dried under vacuum because only under vacuum are the destructive effects of air and heat avoided.

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Chemical Week

Volume 75 **October 23, 1954** Number 17

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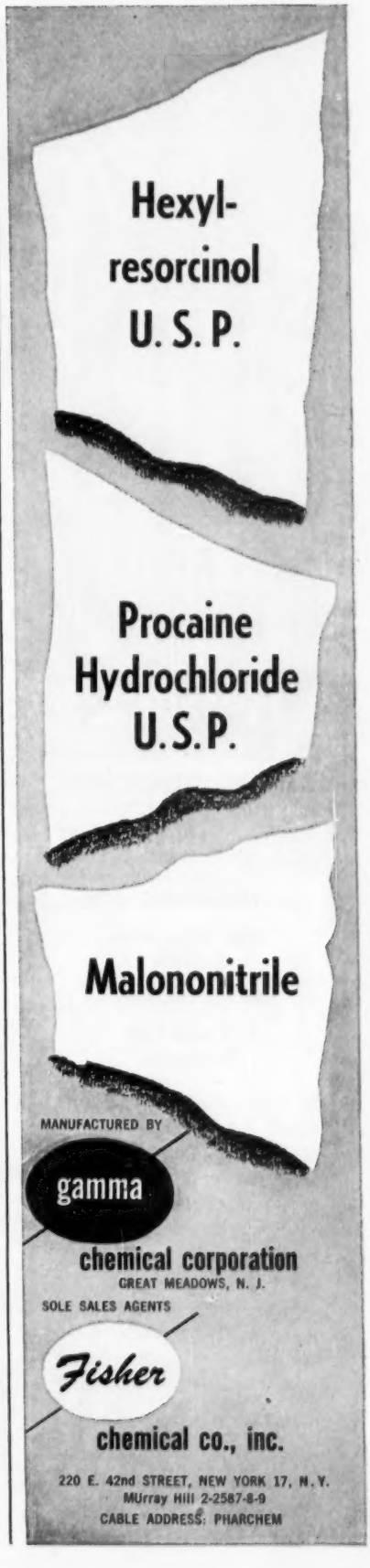

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OPINION . . . . . .

Realistic Look at the Farm

Cheery and well-publicized pronouncements in recent months have harped on this theme: Agricultural production in the U.S. will increase many-fold during the next decade or so; the anticipated growth of our population will *demand* vast additional quantities of foods.

This, in turn, has encouraged many chemical producers to expand their capacity for fertilizers and kindred agricultural chemicals. The consensus has been, as one chemical executive puts it, "You just can't miss if you get into ag chemicals."

There is, we'll agree, a good deal of justification for long-term optimism; but it seems to us that a closer look at the more imminent prospects is now eminently desirable.

Farm income has slipped, is slipping, may well slip further. And when that happens, farmers divide into two camps: one is relatively eager to "ease out of the squeeze" by buying fertilizers and insecticides to boost yields per acre; the other retrenches and buys nothing.

Thus, in our opinion, there is little if any reason for chemical producers to assume that farmers will *demand* heavy tonnages of crop aids in the next few years. It's going to require a lot of effort—a lot of selling—to move the output of some of the many now-abuilding plants.

The farm problem seems to be developing along a line parallel to that of the '20s: mounting surpluses on the one hand, declining farm income and prices on the other. (In the last couple of years the government has had to lay out $4.5 billion for agricultural surpluses. The total now spent or on loan by the Commodity Credit Corp. is over $6 billion, and Congress had to raise the loan authorization to $10 billion this year to take care of further surpluses which are expected to accumulate.*)

The decline in farm income has come about, primarily, because farmers have been so productive. Output in 1952 and 1953 was roughly a third higher than prewar, and was even some 7% above the 1947-49 average.

Demand, nonetheless, slacked off. The value of retail food sales in the home market during the first half of this year was running at a rate slightly below the rate of the first half of 1953. Moreover, agricultural exports have fallen off drastically—by over 25%. Whereas, during the 1945-52 period foreign markets absorbed one-third of U.S. agricultural production, recently they have been taking only about a fifth. All signs point to "overproduction" in 1954.

The prospects of boosting demand are discouraging—at least in the short run. Chronic malnutrition and even hunger exists over a large part of the

* A train loaded with all the wheat, corn, flaxseed, soybeans, and small grains in which C. C. C. funds are already invested would be 8123 miles long. And this still would not include the cotton, tobacco, dairy products and various other commodities in government storage.

One Area Only

It was just a fortnight ago that we ourselves wrote—in discussing the chemical industry in southern Los Angeles County: " . . . civic pride is a southern California trademark . . . borne with especially fierce zeal by Los Angeles and Long Beach residents." That truth has been driven home since by the deluge of telephone calls, telegrams, letters we have received from angry Angelinos complaining that their companies were ignored.

The chemical industry in the Los Angeles area can be justly proud of its stature—and any company there might well be justly disturbed if it feels it was overlooked in our Oct. 9 report. Actually, the key to the misunderstanding is the qualification in the second paragraph of the text: "within a 10-mile radius in southern Los Angeles County and adjacent Orange County."

In this instance, we concentrated our attention on, and discussed only, chemical developments in the Los Angeles Harbor area. This includes the towns of: San Pedro, Wilmington, Long Beach, Seal Beach, Dominiguez and Torrance. And these areas, and these areas only, were highlighted and coded on our accompanying map.

One ambiguity certainly crept in, however, when we did not specifically define the area in the key adjoining the map.

Other sectors of the Los Angeles area may, of course, provide the basis for future regional reports. —Ed.

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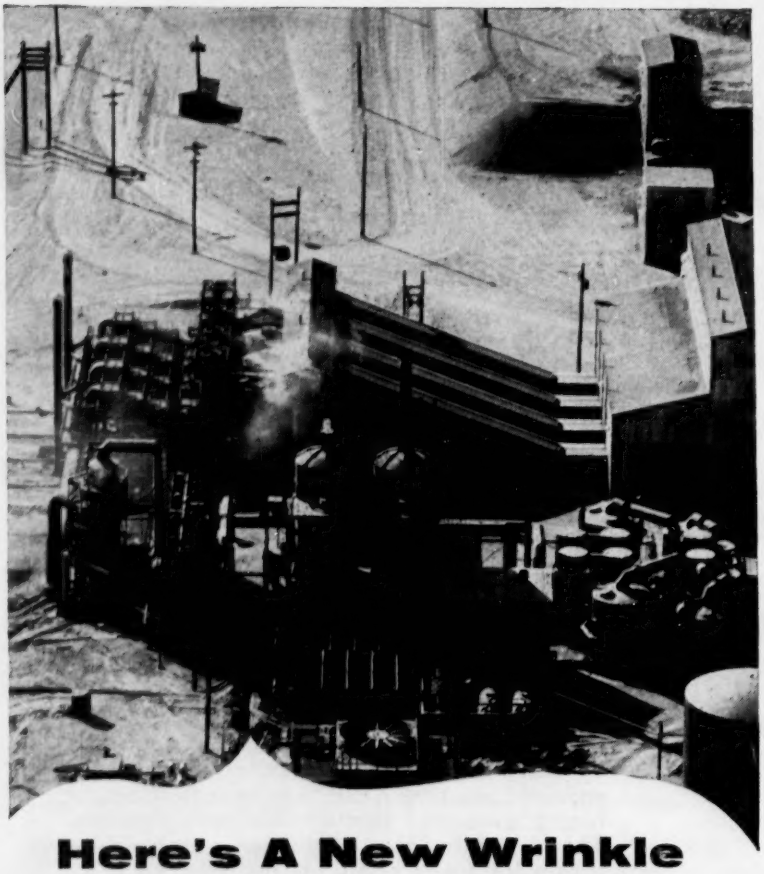

Here's A New Wrinkle In The Sulfur Picture...

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OPINION . . . . . .

earth's surface, but the underfed simply do not have the purchasing power to buy our food. The alternative—to give it away—is by no means an easy solution. Aside from deep-seated Congressional reluctance to increase government spending and foreign aid, there are formidable administrative difficulties in getting the food to those in need without depressing world agricultural prices.

None of the measures taken or contemplated by the government seems likely to raise farm income in the near future. From a business viewpoint, then, farmers are likely to constitute a somewhat depressed market for some time. There seems to be no pat or pleasant way to counter that.

Farm prices, as well as income, have been slipping—slipping pretty badly. They are today some 20% below their 1951 peak. Net farm income is down by 16%. Farmers are netting $2 billion a year less than they did in 1951—and the value of their land and other assets fell by $10 billion in 1952 and 1953 alone.

But over the long pull, there are a number of factors operating in favor of agriculture:

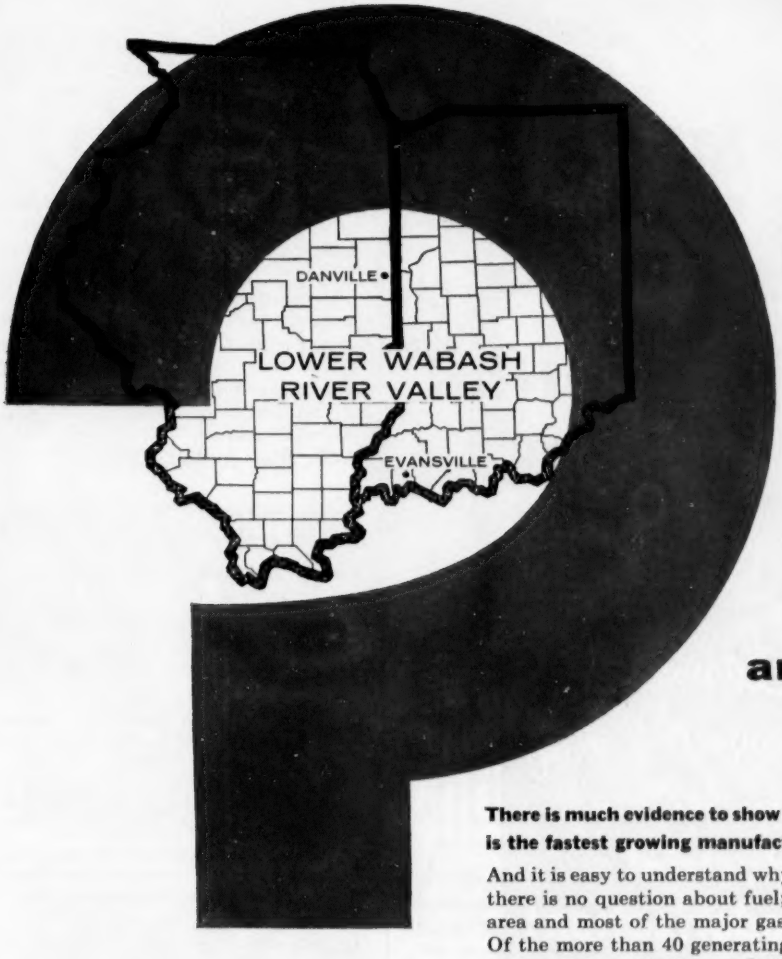
• Natural growth. Over the next two decades, domestic demand for agricultural commodities should grow by about 2% a year merely as the result of increases in population and national income.

• Reduction in the number of farms. Perhaps a million farm families realize less from their labor on the farm than they could earn outside. If national prosperity can be steadily maintained, there will be a continuing exodus of such families from the farms.

• Commercial exports. It is surprising that we are today exporting a 13% smaller volume of agricultural products than in 1929, despite a nearly 50% increase in farm production. Increasing dollar availabilities abroad, accompanied by a trend toward removal of import quotas and greater convertibility of currencies, is a primary hope.

• Strategic uses. If the cold war persists, and if the danger of atomic attack grows, there will be an increased appreciation of the strategic value of food stocks.

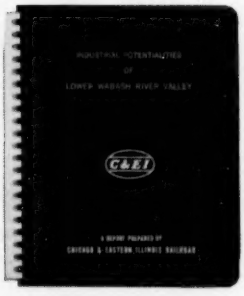
• Structural reorganization. There is increasing emphasis on meat production and dairying, and also on the growth of fruits and vegetables. These have a higher unit value, and the potential demand for them is more readily expansible as consumer income rises. (One example of potential demand: the U.S. so far consumes only about half as much milk and milk products per capita as Ireland or New Zealand.)



is this the country's fastest growing manufacturing area

There is much evidence to show that the Lower Wabash River Valley is the fastest growing manufacturing area in the country.

And it is easy to understand why this has happened. For example, there is no question about fuel; it is a leading coal producing area and most of the major gas lines cross the area. Electric power? Of the more than 40 generating stations located here, two are among the world's largest. Labor? The area has a population of 2½ million. Transportation? It is the hub of a 9000-mile inland waterway system—it is served by over 20 major railroads and has well maintained highways. Chemicals? There is abundant fluorspar, high calcium limestone, dolomite, rock asphalt, phosphate rock and barite to name just a few mineral materials. And, many other raw materials are in or near this area located between supplies and markets.



Write for this new *INDUSTRIAL FORE-SITE Guide

This fact-filled book of more than 400 pages is a comprehensive economic study of the Lower Wabash River Valley. Contents include a geologic map and cross sections—maps of inland waterways and major railroads—freight schedules—power supply details and electric rate charts—locations and sizes of gas lines—the water supply for specific towns—crop and livestock production by counties—forests and timber resources—population characteristics—types, locations and sales of wholesalers and retailers—plus a full description of each of the 20 major industry groups.

You or your consulting firm may obtain a copy of "Industrial Potentialities of the Lower Wabash River Valley" by writing to:

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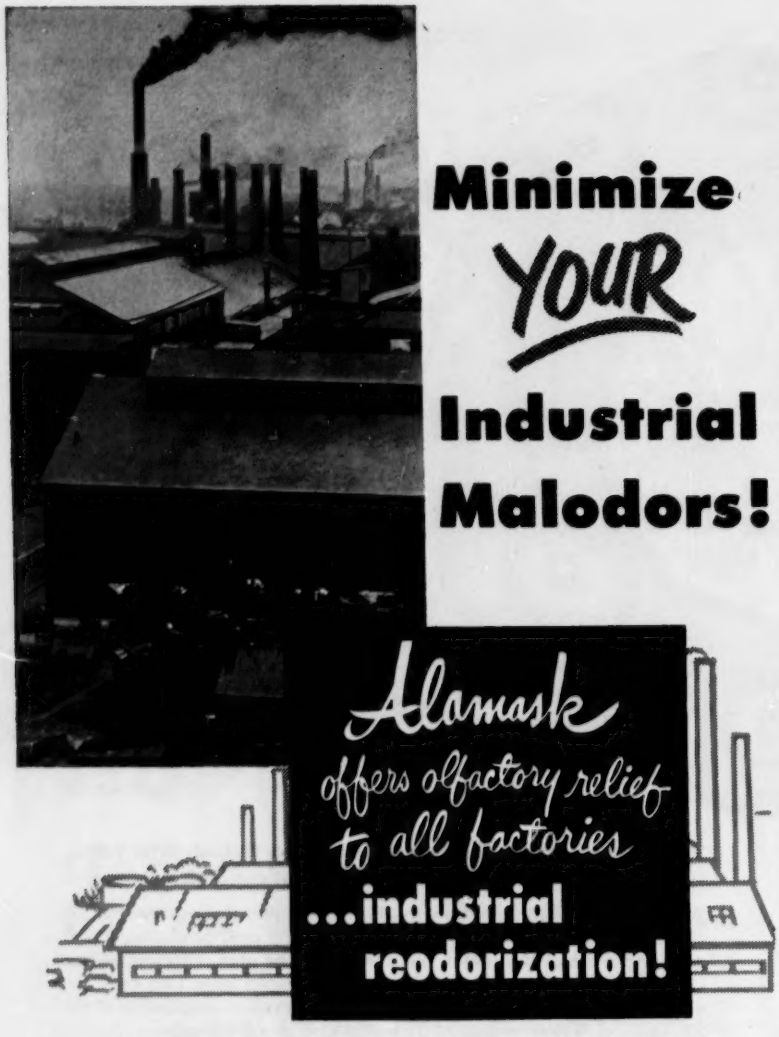

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OPINION . . . . . .

The most positive element in this year's agricultural legislation is the idea of using price supports and acreage restrictions in such a way as to support and hasten this trend towards a feed-livestock economy.

In essence, the long-term outlook is not discouraging. Those companies which have geared their agricultural chemical outlook to the long-term view may well expect to have their confidence justified and their foresight rewarded. But that doesn't mean that next year—and the year after—are not going to be hard selling years. Any producer who does not have his thinking attuned to that reality might well attune it now.

—W. Alec Jordan, Editor

DATES AHEAD

Packaging Institute, annual forum, Roosevelt hotel, New York, Oct. 25-27.

Assn. of Consulting Chemists and Chemical Engineers, annual meeting and symposium, Belmont Plaza hotel, New York, Oct. 26.

Plastics in Building Conference, sponsored by the Society of the Plastics Industry, the Manufacturing Chemists' Assn., and the Building Research Advisory Board, National Academy of Sciences, Washington, D.C., Oct. 27-28.

Society of Rheology, annual meeting, National Bureau of Standards and Sheraton Park hotel, Washington, D.C., Nov. 3-5.

Air Pollution Control Assn., semiannual technical conference, Biltmore hotel, Los Angeles, Nov. 4-6.

National Paint, Varnish and Lacquer Assn., annual meeting, Palmer House, Chicago, Nov. 15-17.

National Foreign Trade Council, annual convention, Waldorf-Astoria hotel, New York, Nov. 15-17.

Magnesium Assn., annual meeting, Chase hotel, St. Louis, Nov. 15-17.

Industrial Hygiene Foundation, annual meeting, Mellon Institute, Pittsburgh, Nov. 17-18.

Federation of Paint and Varnish Production Clubs, annual meeting, Palmer House, Chicago, Nov. 18-20.

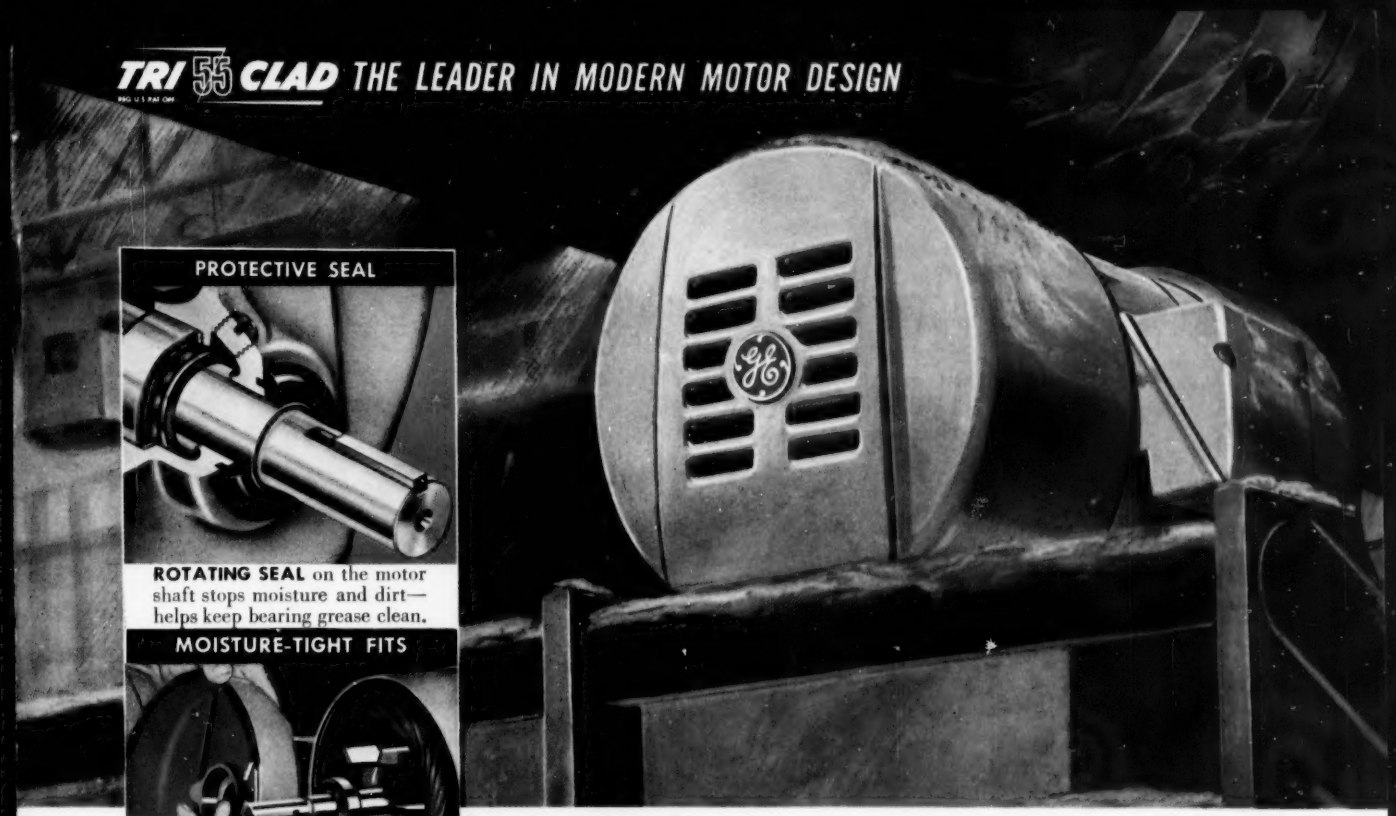
Chemical and Plastic Industries Equipment Salon, Parc des Expositions, Paris, France, Dec. 2-12.

American Pharmaceutical Manufacturers' Assn., combined midyear and Eastern section meeting, Waldorf-Astoria hotel, New York, Dec. 6-8.

Chemical Specialties Manufacturers Assn., annual meeting, New Yorker hotel, New York, Dec. 6-8.

American Institute of Chemical Engineers, annual meeting, Statler hotel, New York, Dec. 12-15.

TRI 55 CLAD THE LEADER IN MODERN MOTOR DESIGN



ROTATING SEAL on the motor shaft stops moisture and dirt—helps keep bearing grease clean.

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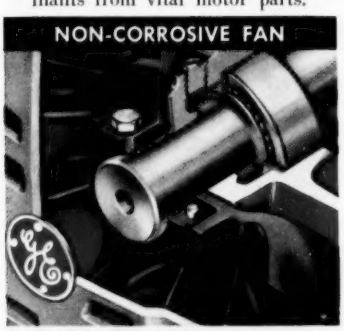

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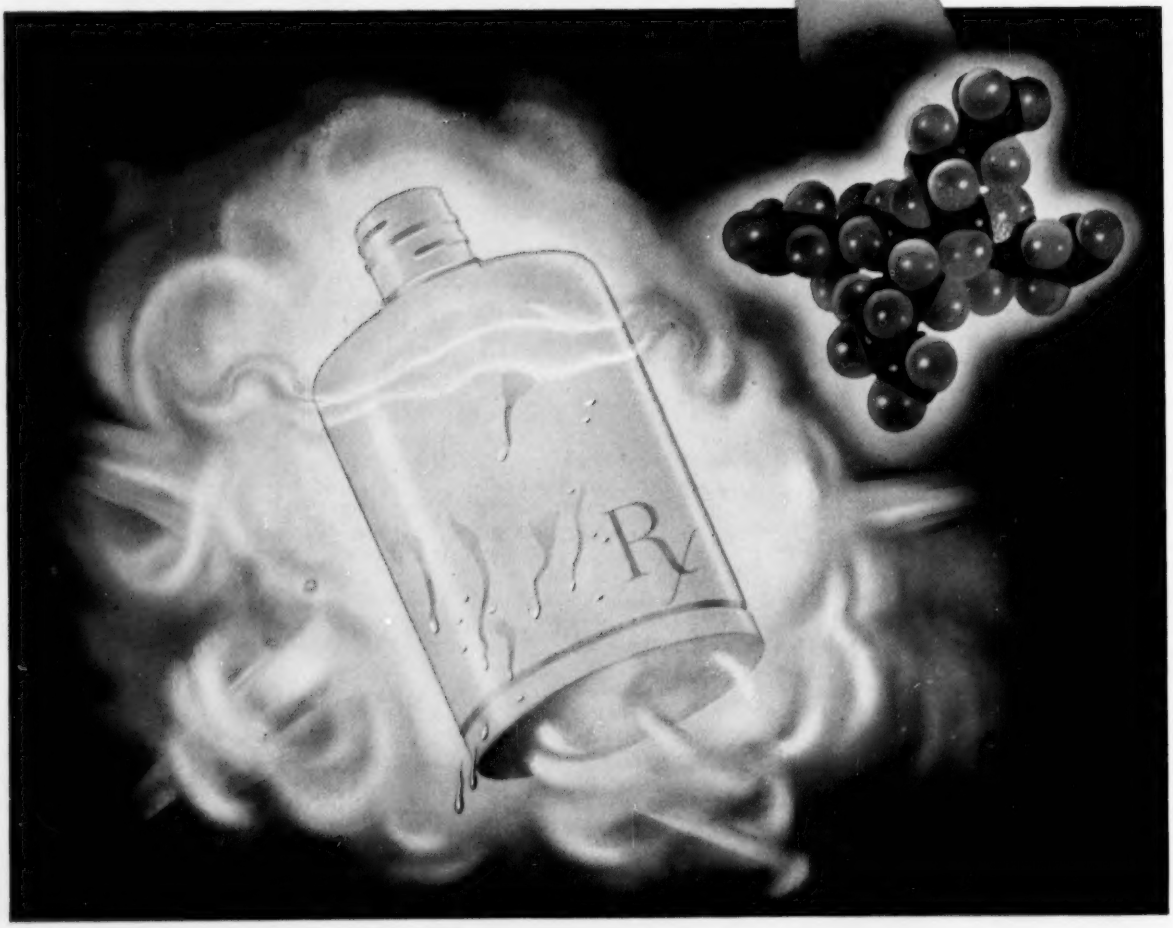

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NEWSLETTER

The Supreme Court acted on nearly 400 cases last week, noted some of the cases it would decide this term and some it has already decided not to hear.

For the chemical industry, the most significant action was acceptance of the Justice Dept.'s appeal of a ruling dismissing cellophane monopoly charges against Du Pont. This means that the Court will rule later whether the government proved the charge that Du Pont, because it holds about 75% of the market, has a cellophane monopoly. A federal district court dismissed the charge, ruling that—despite this and the increased demand for cellophane—Du Pont's position resulted from "technical skill and competitive activity" and that cellophane is only one of many similar competitive wrapping materials.

In other cases, the high court:

- Agreed to decide whether to sustain a Federal Trade Commission order directing Rhodes Pharmacal Co. to advertise the pain-relieving qualities of Imdrin as only "temporary." A federal court has ruled FTC's order is too ambiguous as written.
- Refused to reconsider its ruling last year in the Phillips Petroleum case, which put sales by some 4100 natural gas producers to interstate pipelines under federal regulation for the first time.
- Refused (for the third time) to hear Ferroline Corp.'s argument that General Aniline & Film wrongfully appropriated Ferroline's secret process of manufacturing iron pentacarbonyl.

•

Mark down Shell Oil as a new contender in elemental sulfur. Shell was the sole bidder for offshore sulfur tracts offered for lease by the federal government *(CW, Sept. 25, p. 13)*.

Shell was the only bidder on any of the 108 tracts (5000 acres each) of potential sulfur-producing ocean bottom. It bid on five areas, offering a total bid (called a cash "bonus") of $1,223,500. In addition, it will pay the federal government a 7½% royalty on sulfur sales.

•

Federal Trade Commission has formally adopted trade practice rules for the chemical soil conditioner industry. Rules announced by FTC are substantially the same as were discussed on a tentative basis at an industry hearing held in New York last spring *(CW Newsletter, April 17)*. For instance, directions for use of conditioners must include depth of a specified area that will be benefited. The rules, promulgated Oct. 15, become effective in 30 days.

•

The Bureau of Mines regional headquarters will remain at Albany, Ore., and will have increased responsibility, despite a Dept. of Interior administrative survey committee's recommendation that headquarters be moved to Reno, Nev. *(CW Newsletter, Aug. 7)*. Secretary of Interior McKay has decided to overrule the committee's recommendation.

Moreover, the office's responsibility will be extended to supervision of stepped-up activities of the bureau in Alaska.

•

If you make, sell or use pesticides, you'll want to study this

Wednesday's *Federal Register*. The issue outlines tentative regulations setting tolerances for 26 pesticides, barring any residues of 9 others, and exempting 6 materials from residue rules. Further, it tells the procedures Food & Drug Administration will follow and the fees it will charge for setting tolerances under the Miller amendment.

Written comments may be submitted during the next 60 days, after which final regulations will be issued. Since the tolerance specifications are based on 1950 hearings, makers who feel that newer data justify new findings can seek modification; and firms that have developed new insecticides must follow similar procedures.

If everything goes according to schedule, regulations will be issued early next year; FDA inspectors will then have a definite guide to allowable pesticide levels on food products in normal trade channels. Enforcement will follow the usual FDA pattern—seizure of overtolerance products, injunction against further manufacture or use.

•

Corporate activity is busting out all over:

• Union Carbide got the biggest fast tax write-off in Office of Defense Mobilization's latest list; it's for 90% of the $31.5-million sponge titanium plant at Ashtabula, O.

• Texas Butadiene & Chemical, Houston, got 100% on $25,759,000, smaller percentages on the remainder of its $29,329,000 facilities to produce butenes, butadiene and aviation alkylates.

• Diamond Alkali paid $15,127,000 for Dept. of the Army's 225 tons/day chlorine plant at Muscle Shoals, Ala. The Army retains preemption rights, but there's general agreement that they don't mean much: they're not likely to be exercised except under full mobilization when all chlorine would be put under allocation.

• American Potash & Chemical has completed plans to build a lithium chemicals plant near San Antonio. The facilities will be owned by American Lithium Chemicals, the American Potash-Bikita Minerals subsidiary (See p. 16). Bikita will supply lithium raw materials from its Southern Rhodesia deposits. Total capital involved is about $8 million. Initial product at San Antonio will be lithium hydroxide.

• Union Oil next week will send six vice-presidents to Rifle, Colo., where they will undertake a six-months' study of how best to exploit the firm's oil shale resources. There's no question but that Union will build a plant; but when, how big, how costly, and what products to make are factors still to be decided. Indicated minimum size, however, is 25,000 barrels/day.

•

AFL and CIO have taken the big step that makes merger a better-than-ever possibility. Officials on both sides have decided to merge at the top, then work out problems between individual unions. Under the plan all AFL and CIO unions would move into the federation as separate, autonomous entities; the chemical unions, for example, would still be distinct organizations, but settlement of jurisdictional disputes and eventual joining of forces would be given impetus by being thrashed out under one roof. Target time for unification: end of 1955.

•

"Chemical Corn" is a name you'll be hearing—and it's not a synthetic cereal but the nation's sixth largest bank. Formed by merger of Corn Exchange with Chemical Bank, it's the latest move in the history of a chemical maker that started a banking sideline in 1824.

. . . The Editors

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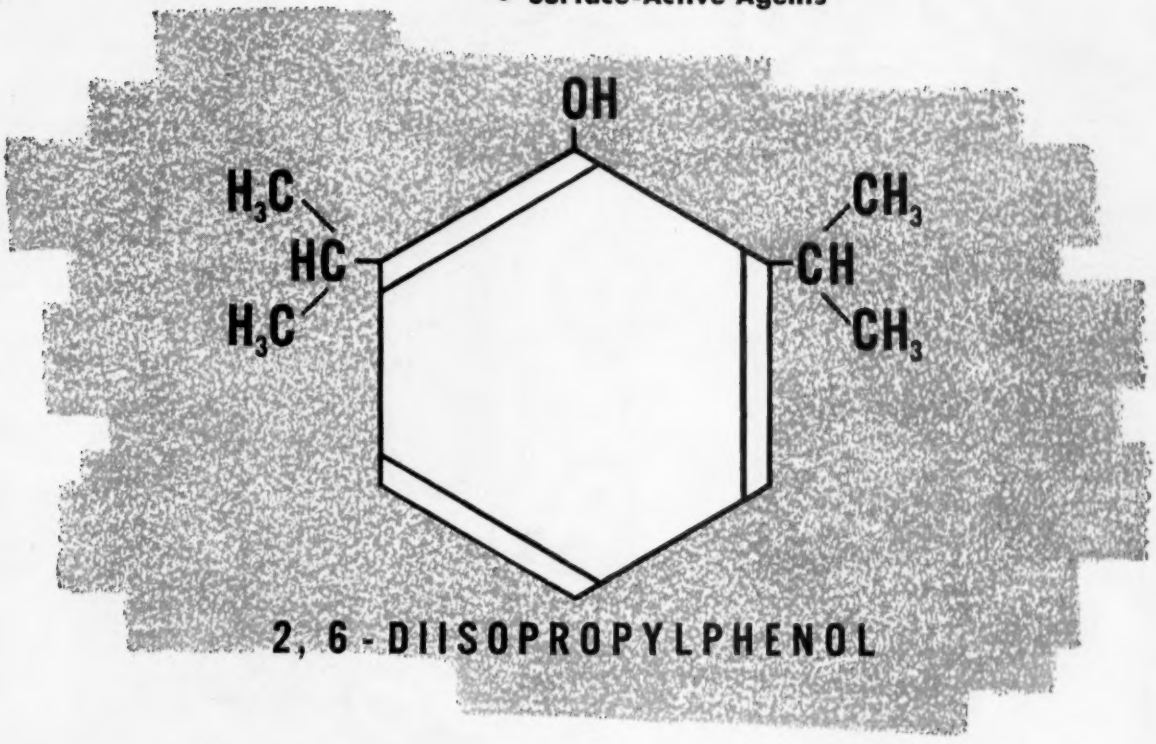

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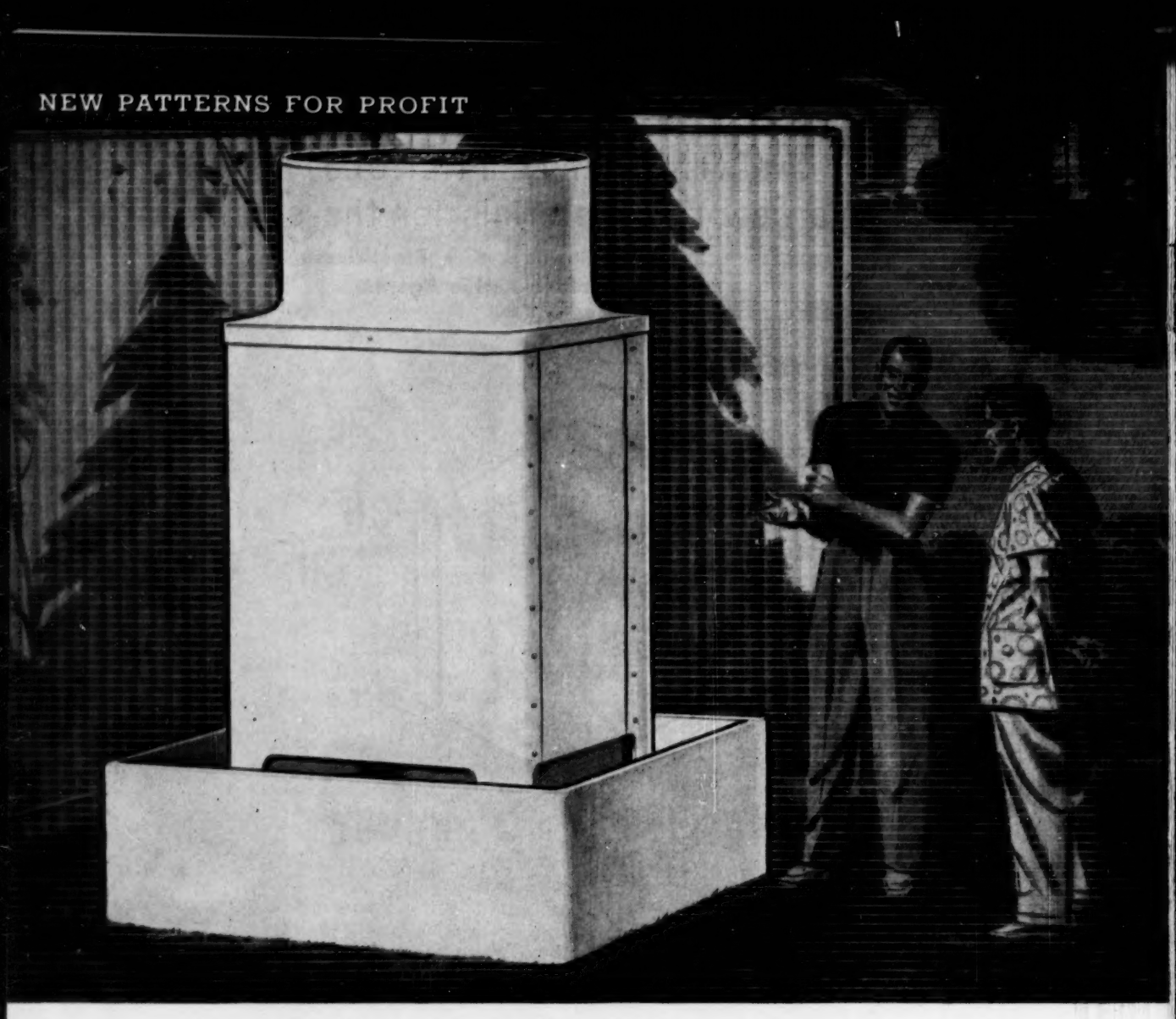

Could Easily Assembled Reinforced Plastic Cooling Towers Cut "Water Cost," Spur Built-in Home Air Conditioning?

Excessive water use—that's been a major drawback to built-in air conditioning for private homes...when a small "custom built" cooling tower was beyond the "budget." But a standardized, molded plastic cooling tower might be the answer!

The "home size" cooling tower illustrated provides 48 cubic feet for standard redwood filling . . . consists of six pieces, easily assembled from just ***four*** separate moldings; could be shipped "knocked down." The attractive, colorful reinforced plastic is the same material used in glass-reinforced plastic sports car bodies, flat and corrugated building panels, molded bath tubs, and hundreds of other applications. It is a "no maintenance" material, light in weight, rot-proof, chemically resistant.

The cooling tower shown is a preliminary design . . . but worked out in all details except the filling. If you would be interested in manufacturing (or distributing) this tower, contact Monsanto. If you'd like to study a set of engineering drawings showing the design of the molded cover, sides, sump and details of assembly, send $1.00 to cover handling and mailing. Manufacturers who prefer to subcontract for reinforced plastic parts can reach reliable custom molders through Monsanto.

Monsanto is a major producer of **STYRENE MONOMER, PHTHALIC** and **MALEIC ANHYDRIDE,** and **FUMARIC ACID** . . . basic raw materials used in the manufacture of polyester resins. For application details, write or call **MONSANTO CHEMICAL COMPANY, ROOM 1503, PLASTICS DIVISION, SPRINGFIELD, MASS.**

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BUSINESS & INDUSTRY . . .

Here's How the Business Indicators Look Today

PRODUCTION: Picking up somewhat—both in hard and soft goods. Chemical production is running way ahead of most other commodities.

PRICES: Generally stable—in all lines of business.

CONSTRUCTION: Booming in chemical industry; only slightly less active in other industries.

EMPLOYMENT: Now running around 62 million, showing little sign of change.

UNEMPLOYMENT: Hovering around 3 million.

COST OF LIVING: Holding steady at year-ago levels.

EXPORTS, IMPORTS: Total domestic and foreign exports (for all industries) have decreased considerably of late. Total general imports have dropped correspondingly.

No Boom, No Bust

Spotlighted by an approaching election day, the pulse of the business situation this week is being closely watched by industry men everywhere. Their consensus: that the much-desired economic stabilization—for which the Eisenhower Administration has been plugging—is now beginning to plague the Republicans.

Business has been moving sidewise when the top government economists would have liked a decided upturn. The upswing had been expected last spring, then this fall. And while some industries (the chemical industry, for example) are turning in sparkling third quarter returns, other sectors of the economy are noticeably sagging.

Noting this, the Pentagon may give things a nudge with new contracts for military goods. (Something like $1.2 billion in orders have been placed within the past few weeks.) Long-range, one of the big business stimulants could well be the Eisenhower plan to double spending for highway construction—some $4 billion in spending per year.

It looms as a continued policy of easy—rather than hard—money. And—regardless of who wins the November Congressional elections — a trend toward increasing inflation.

If the Republicans keep control of Congress (and forecasters are predicting a "mere squeak-through") it will mean that to win both the Presidency and the Congress in 1956, the politicians will be pressuring Eisenhower to step up programs designed to spur prosperity.

And on the other hand, if the Democrats win, they'll push for new tax cuts for consumers via an income tax reduction as well as new public works in the West—likewise driving for prosperity and increasing inflation tendencies.

That, in essence, is the Washington outlook for the immediate months ahead, barring any major break in world power politics.

The big question in 1955, from an industrial angle, will be whether the economically strong industries (like the chemical industry) can pull the weaker ones along.

Response from Industry: Capital spending plans—usually a reliable indicator of confidence—would suggest that chemical men are sure they're capable of doing just that, however. Currently estimators of capital expenditures predict that after a year's lull, chemical expansion investments in 1955 may run close to 1953's heady bill.

Moreover, chemical planning committees are now noticeably more loquacious about their plans. Consensus: the "wait-and-see" period is just about over; many projects that had been temporarily shelved are now being dusted off again, will be launched soon after the turn of the year.

Stocks Steady: Chemical stocks, following the general pace-setting tendency of capital expenditures, are also in a relatively good position. In most cases, earnings per share in 1954 should come close to last year's levels. Du Pont earnings should be particularly good—may reach $6.50 a common share compared with $4.94 in 1953 (after about $2 a share of excess profits taxes).

Monsanto full-year earnings, on the other hand, may be under the $4.90 per common share in 1953 by a fair margin. Carbide earnings, likewise, seem liable to dip to $3/share as compared with $3.55 in 1953. One reason: higher depreciation and amortization charges.

A major factor that's making the economic pulse of the nation as a whole hard to diagnose is the wide variations apparent by regions (see p. 4).

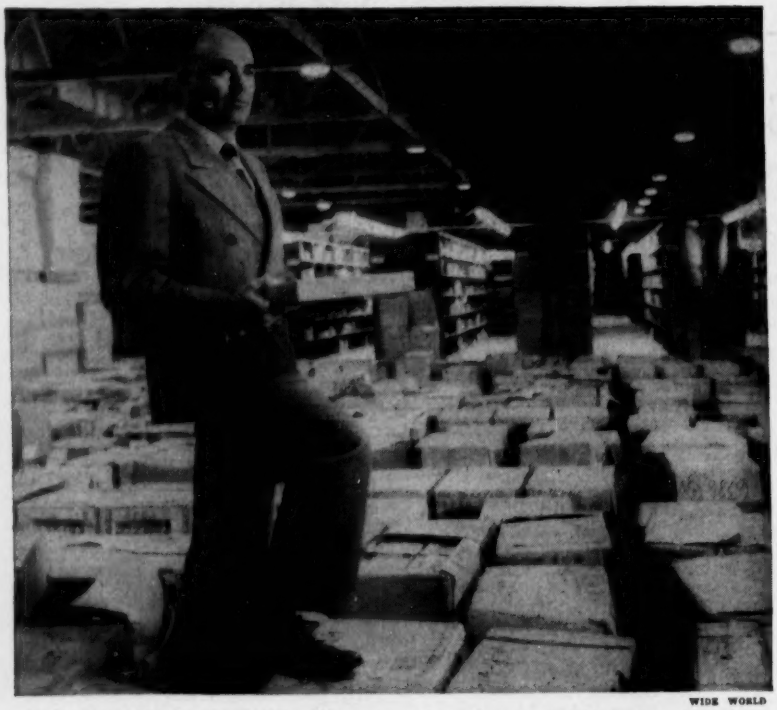
Other Signposts: Compared with this time last year, the cost of living in the U. S. hasn't changed at all (Aug. '53, 115.0; Aug. '54, 115.0). Housing starts have picked up—from 95,100 a year ago to 114,000 in Sept. '54.

Inventories are holding steady—stood at $46.9 billion a year ago, $43.9 billion in Aug. '54 (with seasonable adjustments).

The wholesale price index has dropped—but slightly—from 110.2 a year ago to 110.0 in Sept. '54.

Average weekly earnings (manufacturing) are up—but again only slightly from $71.41 a year ago to $71.86 in Sept. '54.

It averages out as a rather hopeful economic picture for the months ahead. Most industries should show a 4% increase over 1954 readjustment levels. And the chemical industry—judging from current trends—will be well in the vanguard.



WIDE WORLD

GSA'S MANSURE: On $16.5-million magnesium plant, only bid to date hits snag.

For Prize Plant, No Takers

Hanging fire this week because of a knotty antitrust issue: the federal government's move to sell its 36,000 ton/year magnesium plant at Velasco, Tex.

This plant—largest of the government's six magnesium facilities and the only one now in production—is operated by Dow Chemical Co. on a lease running to the end of this month. Dow has an option to renew the lease, but wants to buy the plant instead. General Services Administration—which has appraised the facilities at $16.5 million—has approved Dow's $13.5 million offer; but the Justice Dept. objects to this sale. Antitrust officials contend that selling the plant to Dow—the country's only commercial producer of magnesium—"would tend to maintain a situation inconsistent with the antitrust laws."

Site Sold: The Velasco magnesium plant is located smack in the middle of a 500-acre industrial site purchased by Dow from the government in 1947. In its own facilities there, Dow produces styrene and a variety of chlorinated hydrocarbons. When that purchase was being negotiated, Justice blocked Dow's acquisition of the magnesium plant as tending to "further a monopoly."

The Justice Dept. still holds that same position, suggests GSA sell the magnesium plant to some other firm.

This GSA Administrator Edmund Mansure has tried to do. In recent months, his agency has dickered with such prime prospects as Alcoa, Kaiser, Reynolds Metals, Bohn Aluminum, Harvey Machine and Great Lakes Carbon. Each one has turned thumbs down. Major reasons:

- The market for magnesium is still quite limited, and Dow's 30,000 ton/year plant at Freeport alone can handle more than half of the expected demand for the next few years.*
- Operation of the Velasco magnesium facilities could be a ticklish proposition, in that Dow owns and operates the adjacent power plants, warehouses, water-gas lines and other utilities.

So GSA's chances of selling the Velasco plant to some company other than Dow are regarded as just about nil. Meanwhile, Dow hasn't decided whether to renew its lease if its purchase bid is finally rejected. The Justice Dept. has left the door open for an appeal on its ruling.

Dow says it would welcome competition in magnesium, that the only reason it's the sole producer is that other concerns have been unwilling to invest in this tricky field. Dow insists that talk about a monopoly in light metals doesn't mean much; magnesium, says Dow, is in spirited competition with aluminum.

*Excluding shipments to the national stockpile, Dow produced 36,000 tons of magnesium last year at both Freeport and Velasco. The stockpile goal is just about reached now, or will be very soon. Government experts figure defense and civilian needs for magnesium at 42,500 tons this year, 48,000 next year, and 55,000 tons in 1956.

New Dumping Defense

At least a partial victory for the U.S. chemical industry appears in the new rules—published last week—for procedures to protect domestic industries from unfair competition through "dumping."

In the trade-and-tariff panel at last year's winter conference of the Manufacturing Chemists' Assn., Allied Chemical's Richard Hansen suggested that one way in which the antidumping act of 1921 might be improved would be to have the Tariff Commission—rather than the Treasury Dept.—make the investigations and findings in alleged dumping cases.

Following enactment of the customs simplification act this year, new regulations have been drawn up for antidumping probes. Under the new plan, an industry that feels it's being injured by dumping can ask Tariff for an investigation; and the commission then can recommend to the President that the tariff rate in question be increased.

But while the commission now will determine whether a U.S. industry is being injured, Treasury—whose officials are familiar with intricacies of foreign currencies—will still determine whether a material is being imported at a price below its fair production cost.

Boil-up over Lithium

At issue in the current lawsuit between American Metal Co., New York, and American Potash & Chemical Corp., Los Angeles: the business of refining lithium chemicals "from ores of a higher grade than any discovered elsewhere in the world to date and occurring in one of the largest lithium ore deposits known."

American Metal filed the civil suit in New York state supreme court, alleging that American Potash has not lived up to the provisions of two agreements on joint efforts in the field of lithium chemicals. American Potash admits that it has carried out certain undertakings in this field without consulting American Metal, but asserts that these moves did not in any way violate their agreements of Aug. 31 and Oct. 14 last year.

Eyes on Africa: In the first agreement, according to American Metal's complaint, the two companies contracted to keep each other informed about lithium investigations, to share equally the costs of exploration and development on any lithium project deemed promising, and to have equal interests in any operation that might result.

Third party in the second agreement was Selection Trust Ltd., an English firm described as a close business associate of American Metal. STL, through a 100%-owned subsidiary, held options to purchase the lithium-rich Bikita properties in Southern Rhodesia. As explained in the complaint, this contract provided that American Metal and American Potash each had the right to subscribe to about 20% of the stock in that STL subsidiary; and that American Potash would provide technical advice, assist in erecting a plant for chemical treatment of the ores, and act as selling agent for the Bikita products.

No On-Spot Refining: But instead of setting up a refinery in Africa, American Potash caused American Lithium Chemicals, Inc., to be organized as a Delaware corporation, and negotiated contracts with the Bikita company calling for:

- Sale of Bikita output—in the form of crude and processed ores—to American Lithium.
- Sale of the refined chemicals by American Lithium to the U.S. government.
- Sale of not quite 50% of American Lithium stock to the Bikita concern.

American Metal says it's been ignored in these dealings, is asking a decree that American Potash must provide full information on these matters and that American Metal should have the right to buy one-half of the American Potash holdings in American Lithium.

In reply, American Potash avers that the earlier agreement was not intended to cover the Bikita operation. It insists that treatment of the ores by the Bikita company was economically impracticable, making it necessary for the ores to be refined in the U.S. Under present security regulations, American Potash goes on, it's not authorized to tell American Metal about the bid to sell lithium chemicals to the U.S. government. American Potash denies that American Metal is entitled to any share in American Lithium, and is requesting that the suit be transferred into the U.S. District Court in New York.

PHYSICIST BOHR: In atomic energy parley, a plea for continued collaboration.

Bonanza or Bamboozle?

Private industry's plans for big-scale use of atomic energy are still up in the air, but many companies are making progress in pulling their plans down toward a solid-ground footing.

That's the consensus of management thinking as expressed in speeches and in corridor conversations at last week's third annual conference on atomic energy in industry, staged by the National Industrial Conference Board in New York's Commodore Hotel. On the minds of the approximately 1000 persons attending: cheap electric power, acceleration of industrial chemical reactions, research for licensable product and process inventions, and more profitable refining of uranium ore.

Immediate and near-future economics of atomic energy in industry got varying interpretations. The plunge-right-in view: "Don't be bamboozled by the thought that this is such a very special business that it's not for you," counseled Frederick Warren of General Dynamics Corp. "It's a place for normal American private initiative." The look-before-you-leap attitude: "If anyone claims that the new atomic energy act turns over to private industry a bonanza in the form of already-solved technical and economic problems and an assured profit, either he doesn't know the facts or he's an arrant demagogue," cautioned Board Chairman Robert Wilson of Standard Oil Co. (Ind.).

Altruistic aspects of the situation were highlighted by President Eisenhower and Denmark's Nobel-prize physicist, Niels Bohr. They urged international cooperation "to turn atomic energy toward the goals of peace and ever-rising standards of living."

More and Better

In a move aimed at supplying more feed materials for its rapidly expanding gaseous diffusion program, the Atomic Energy Commission last week was making plans to build a new plant in the St. Louis, Mo., area, and increase capacity at already-existing facilities in St. Louis, Fernald, O., and Paducah, Ky. Cost of the entire program: $67 million.

"The function of the St. Louis and Fernald feed materials plants is to convert high-grade uranium ore and concentrates into highly purified uranium compounds or metal," states Sam Sapirie, manager of AEC's Oak Ridge operations (*see p. 50*). "The Paducah facilities will contribute to

the commission's capacity to convert uranium into forms useful to its program."

The new plant will be built on a portion of the government-owned Weldon Spring Ordnance Works—27 miles west of St. Louis. When operating, this processing unit will have a permanent operating force of 1300, will be run by Mallinckrodt Chemical Works—operator of the existing AEC plant in St. Louis.

Contract for the $40-million job near St. Louis is going to Blaw-Knox, Pittsburgh. The $20-million project at Fernald (19 miles northwest of Cincinnati) will be built by Singmaster & Breyer, New York. Giffels & Vallet, Inc., Detroit, has been selected for the $7-million expansion at Paducah. Operators of these installations: National Lead of Ohio, and Union Carbide's Carbide and Carbon Chemicals Co.

No date for the start of construction work has yet been named—but completion of the entire expansion program, according to Sapirie, is expected within three years.

EXPANSION . . .

Polyvinyl Resins: National Starch Products Co., Inc., New York—which just recently merged with Clinton Foods, Inc., Clinton, O., is reported to be looking for a plant site in the Havana, Ill., region. Its intent: to build a polyvinyl resin synthesis plant there to supply East and West Coast plants, as well as the Chicago operations of the newly expanded company.

•

Fertilizer: Jefferson Lake Sulphur Co., New Orleans, will build a multimillion-dollar fertilizer plant in southeastern Idaho. Construction is scheduled to start within the next 90 days; cost will probably run over $3 million.

Jefferson Lake directors, after touring through the southern section of Idaho last week, were quoted as saying that the new plant will probably be built in Bear Lake County—power and water supplies permitting.

Sulfur to be used at the Idaho facilities will be shipped in from either Louisiana or Wyoming. Initial products will include phosphate fertilizer, phosphoric acid, and sulfuric acid.

COMPANIES. . . .

United Gas Corp. and its parent company—Electric Bond & Share Co.—are readying plans to enter the petrochemical field. One indication that the two companies are on the brink of moving ahead came last week in Shreveport, La., where United Gas filed a request with the Securities & Exchange Commission for permission to purchase shares in the new enterprise—to be formally called Gulf Chemical Co.

Under terms of the agreement, both companies will put up $13.4 million for (1) construction of a $22.9-million ammonia, polyvinyl chloride plant near Pensacola, Fla., and (2) $3.8 million in working capital. From time to time, either company could buy 250 units of 4% promissory notes, and $1 par common stock.

United Gas is, at present, part of the Electric Bond holding company system. But under a plan already filed (and approved by SEC), the affiliation will be severed by mid-1955.

•

Smith, Kline & French Laboratories' directors have approved a plan to split the company's common stock three-for-one, subject to stockholder approval of an increase in authorized common shares. Authorized common shares now stand at 2 million, $1 par value; company directors are proposing an increase to 6 million, $0.33⅓ par value.

•

Plants of the Mixed Fertilizer Div., Davison Chemical Co. (division of W. R. Grace & Co.) have now been regrouped into three districts—Central, Western and Southeastern. Headquarters for the three districts will be at Lansing, Mich., Joplin, Mo., and Charleston, S.C.

•

Illinois Zinc Co. directors have voted to increase authorized capital stock from 300,000 to 2 million shares, subject to stockholder approval at the company's annual meeting in January.

•

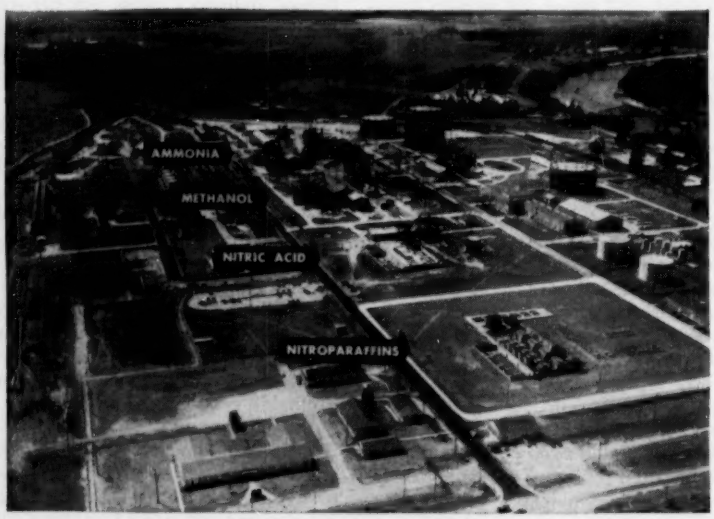
Spencer Chemical Co. in the fiscal year ending June 30, '54, reports net sales up 10.6% (from $30.8 million to $34.1 million), net profits (after taxes) up 13.4% (or from $4.6 million to $5.2 million).

•

Crompton & Knowles Loom Works, Worcester, Mass., has purchased the Althouse Chemical Co., Inc., Reading, Pa. The Althouse Co., has annual gross sales of $3 million—authorized capital of $250,000.

•

H. K. Porter, Inc. Pittsburgh, has taken over control of Laclede-Christy Co., St. Louis. Five of the seven directors of Laclede-Christy—all of whom had opposed sales of the firm to the Porter Co.—have resigned "by request."



Boost for Nitroparaffins

LATEST STEP in Commercial Solvents Corp.'s expansion at Sterlington, La., will be a $5-million nitroparaffin unit, due onstream next August. It will be on the same site as the $20-million methanol, ammonia and nitric acid facilities built last winter. Also ticketed for expansion soon: existing nitroparaffin facilities at Peoria, Ill.

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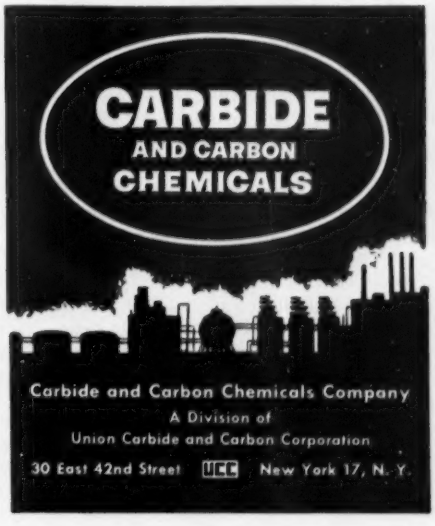

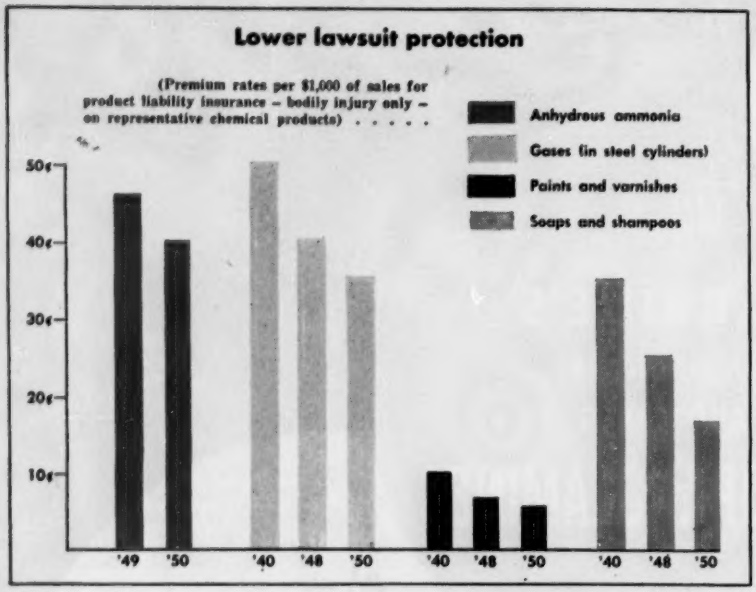

CHEMICAL RISK RATES: As safety records rise, liability insurance rates shrink.

Bracing for Costlier Claims

You might call product liability insurance a kind of necessary evil, like taxes and jury duty; but some chemical companies feel they can get along without it, others have found it a lifeline that kept heavy damage suits from sweeping them into bankruptcy.

Some large chemical companies don't buy this kind of insurance at all, figuring that it's cheaper to shoulder the risk themselves. Some carry this insurance primarily for peace of mind; one leading chemical concern, for example, has had coverage on all its products for 30 years, without a single claim against any of its products being upheld in court.

But for the chemical and allied industries as a whole, product liability insurance by this week has come to be an essential part of the cost of doing business. There's some criticism, to be sure—about the premium rates (which are called "too high," even since the general reduction of these rates in 1950), and about the people who write the policies (some of whom "don't know enough about the chemical business"). Still, it's estimated that makers of chemicals, pharmaceuticals, cosmetics and chemical specialties are paying out several million dollars each year for this kind of protection.

Bakers Came First: Up until about 1930, few chemical companies bothered with product liability insurance. For one thing, the insurance companies weren't "pushing" this line, and only a few rates were established. Even more important, it wasn't until the 1920s that courts began to recognize a special responsibility on the part of each manufacturer, distributor, and service company. During the 19th century, people used to say, "Let the buyer beware"; but now the courts, the lawmakers and the public have pretty well made up their minds that it's the seller who has to be careful.

These are the trends that have made product liability insurance a big business in recent years:

- Courts and legislatures are holding manufacturers to a greater degree of responsibility.
- Juries are assessing larger sums in product liability cases.
- Individual consumers and their lawyers—aware of generous awards that have been made in recent cases—are filing claims in increasing numbers; a few persons have even tried to make a "career" out of such claims.

The notion of liability for commercial products evolved slowly, and even the presence of a needle in a bar of soap wasn't considered grounds for judgment against the firms that made and sold that soap. But the principle began to take hold in countries where commercial competition was keenest, and as soon as the liability was recognized, the market for insuring against customers' claims sprang into existence. It's said that the first product liability insurance policies were written by Lloyd's of London for some bakers of that city who were in trouble because an apprentice had sprinkled pies with rat poison instead of powdered sugar.

Research Required: Bit by bit, the judges and lawmakers pieced out what's expected of manufacturers, and what kind of evidence is necessary to support a claim. While a 1928 case was thrown out because the woman failed to prove that it was the hair dye that had harmed her finger (the court holding that it was not enough merely to show that the injury followed use of the product in time sequence), later decisions have been much more sweeping.

One thing that's expected of manufacturers is plenty of research before a product is marketed. This means not only experimentation to make sure about possible dangers to humans, but also studies to establish how the product will perform under varying conditions. Example: a manufacturer of insecticides lost a case in which a customer sought an award for damages to his peach trees; the Michigan appeals court held that the product should have been tested in that state.

Another requisite: safety instructions and warnings must be prominently printed on labels. Classic example of this point is the carbon tetrachloride case in Pennsylvania about 10 years ago. A housewife died after using a rug cleaning compound containing 45% carbon tet, and her husband sued the manufacturer. It was brought out in evidence that the family had not purchased the compound; the woman's brother had taken it from his employer's stock room. The word "Caution" in quarter-inch letters appeared twice on the container, together with the warning: "Do not inhale fumes. Use only in well-ventilated place." However, the court held that these precautionary statements were not sufficient to counterbalance the implications of the brandname ("Safety-Kleen"), and affirmed the jury's $10,000 verdict. Said the court: "Anyone who is responsible for the existence of any dangerous instrumentality or substance with which persons are likely to come in contact must impose a measure of control that is adequate to the protection of human beings from it."

Broke Within Year: What these trends can mean to a company is tragically illustrated in the case of one small company organized some years ago to market a calcium chloride antifreeze solution. It had to pay hundreds of claims averaging about $100 each; after nine months, the total had

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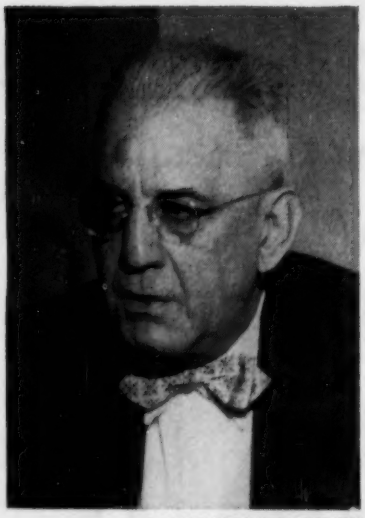

SAM SALZANULO, MCGRAW-HILL

NBCU'S ACKER: In his office, continuous review of rates and risks.

mounted up to $100,000 and the company was bankrupt. One large, diversified chemical company with an excellent reputation for product quality reports "a disproportionate increase in liability cases in the past few years," the majority of which are "nuisance claims—often far less than $100." Insurance adjusters often pay those small claims without much investigation, figuring that it's better to avoid the cost and unfavorable publicity of a contested lawsuit.

In exceptional cases involving bodily injury, juries no longer blink at awarding $100,000 per claim, and in property damage cases, the awards frequently are even larger—sometimes full replacement value plus a sizable "sweetener."

U.S. insurance companies that provide protection against such crippling claims have organized a National Bureau of Casualty Underwriters to coordinate some of the work on common problems, such as legislation. In this bureau's general liability division, headed by Milton Acker, new product liability rates are determined from time to time, based on "experience" with each type of product. The bureau publishes a "Product Liability Manual" listing premium rates for some 21 chemical categories (including "chemicals not otherwise classified") and for numerous other products and services ranging from sparkling wines to automatic sprinkler installation.

The insurance firms also support an Assn. of Casualty & Surety Companies that maintains its own laboratory for investigating the hazardous or toxic nature of all kinds of products. This association publishes "Special Hazards Bulletins" reporting its findings; among its bulletins on chemical products are "Permanent Wave Solutions," "Pressurized Can Dispensers," and "Spray Coating of Nylon Stockings with Freon-propelled Nitrocellulose."

Common Complaints: Among chemical companies, there's a general feeling that product liability insurance is a good idea but that the rates are too high. One large chemical concern formerly had 100% coverage, but several years ago dropped this insurance "because of high premium costs, and because of our correction of apparent hazards." A number of smaller companies have complained to CW that they realize they need the protection of this insurance but simply can't afford the premiums. Several companies have found lower rates offered by foreign insurance companies; one pharmaceutical company says it gets a better bargain by buying its primary coverage (about $250,000 on bodily injury and a like amount on property damage) from a U.S. insurer and its excess coverage from a British firm.

Another complaint: that insurance companies, lacking familiarity with the chemical industry, are too "jittery"—they shy away from new products, and they shun chemical business for months after an isolated accident like the Texas City ammonium nitrate explosion.

What's really needed, says one chemical company with considerable costly experience in this field, is an industrywide survey by the big insurance firms of the liability insurance needs of the entire chemical industry. It can be argued that this is an industrywide problem, in that a mishap involving one company—bad publicity about claims, inability to pay, being forced out of business—reflects on all chemical concerns.

Now It Can Be Told

Net profit of the now-extinct Canadian Industries Ltd. declined during the first half of 1954—the last six months of its existence prior to division of assets and operations between two new companies—Canadian Industries (1954) Ltd., and Du Pont of Canada Securities, Ltd. The lion's share of first-half profits went to CIL '54—by a ratio of over 3 to 1.

That was revealed by last week's release of earnings reports—issued virtually simultaneously by the two new companies. Net income of CIL '54 for the first six months of this year amounts to something over $3.3 million (or 45¢ per share on 7.1 million shares of common stock outstanding). Profit of Du Pont of Canada, on the other hand, was $1.1 million (or 14¢ per share on an equal number of shares of common stock outstanding).

Main reason for the disparity, explains Du Pont of Canada's president, Herbert Lank, was the depressed sales of nylon yarns and staples to Canada's textile industry—a major segment in the Du Pont slice of the corporate split-up. In addition, Du Pont of Canada's profit margins were reduced by lower selling prices and increased manufacturing costs. Too. Du Pont took maximum depreciation allowances on its new plant additions.

Sales Steady, Profits Off: Greville Smith, CIL '54 president, maintains that although profits are at a lower level this year for his segment of the old company, sales have held steady. "Profits were jolted," he says "by the effect of subsistence at the site of the company's Windsor soda and chlorine plant, and by the initial costs and explosion damage at polyethylene facilities at Edmonton."

Assets now held by the two companies have shown a remarkable change since last December, too. CIL '54's have risen from $101.1 million to $106.9 million; Du Pont of Canada's have declined—from $74 million to $70.9 million.

There's no reason to believe, however, that the pull-apart trend will continue. Both companies plan to expand and to diversify.

"On paper it looks bad," admits a Du Pont of Canada executive. "But it's not quite as uneven as it seems. A bad break in the textile market has temporarily stalled the Du Pont-owned company—that's all."

CIL Plans Big Bond Financing

In line with its avowed aim—to expand as rapidly as possible—directors of CIL '54 will ask stockholders this week to approve proposals connected with financing of a $60-million "improvement outlay" and repayment of an $18-million loan from Imperial Chemical Industries, Ltd. A proposed new bylaw would allow company executives to finance in part through the issuance of bonds—rather than capital stock; the remainder will be sought through other methods of debt financing. High on the list of purchases: a $22-million Terylene plant at Millhaven, Ont.—currently owned by ICI.

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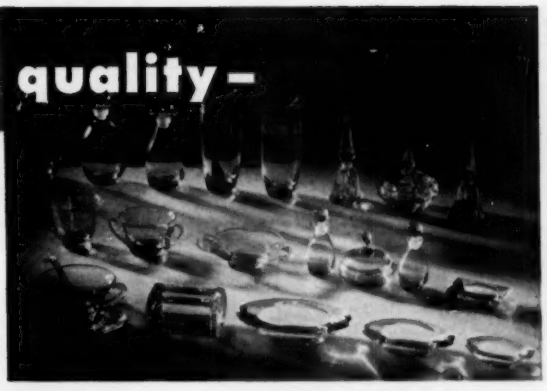

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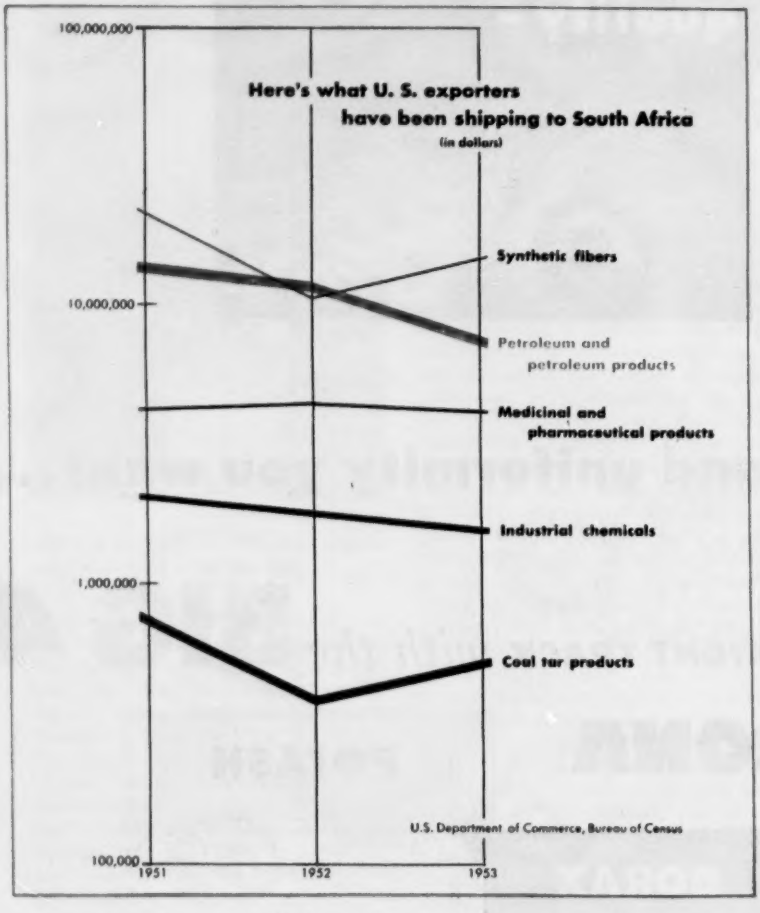


(Dollar values expressed logarithmically)

Now a Buyer, Soon a Seller

Apart from its importance as a consumer of U.S. products, the Union of South Africa has held little, if any, appeal for chemical companies. Growth of chemical facilities in the little British commonwealth has provoked more curiosity than interest.

But within the next few months, U.S. chemical companies may be jolted out of their indifference. Slowly, and painfully, the "youthful giant to the south" is moving into its chemical age. What it will mean to U.S. producers is obvious: with South Africa able to supply more of its own demands for chemicals, another fertile market for U.S.-produced commodities will evaporate.

Heralding the transition—from chemical consumer to chemical producer—is the new South African oil-from-coal synthesis plant—engineered by N. W. Kellogg Co. Booked as the world's largest (and "first") plant of its kind, it appears certain that SASOL (South African Coal, Oil, and Gas Corp., Ltd.) won't influence imports much this year—but will launch South Africa on the road to self-sufficiency in petrochemicals by 1955 and pit it in direct competition with U.S. producers for overseas sales before 1960.

No End to Possibilities: Though the complete tally of by-products that will become available when SASOL is in full operation isn't being detailed yet, officials of the company expect that within the year, production will include:

- Ammonia.
- Paraffin waxes (approximately 23,000 tons).
- Low-temperature tar.
- Ethyl, propyl, and butyl alcohols.
- Benzol, xylol, toluol, ketones, creosote.
- Ammonium sulfate (approximately 9.5 million lbs.).

Future developments, of course, will depend on the success of SASOL's new operation—but local chemical entrepreneurs enthuse over their opportunities. Some manufacturers, it's known, are looking hard at possibilities in synthetic rubber, synthetic fibers, plastics and fertilizer fields. And if for nothing else their plans are notable for their ambitious character. For synthetic rubber alone, Union government men feel that a plant capable of producing 20,000 long tons/year is now justifiable.

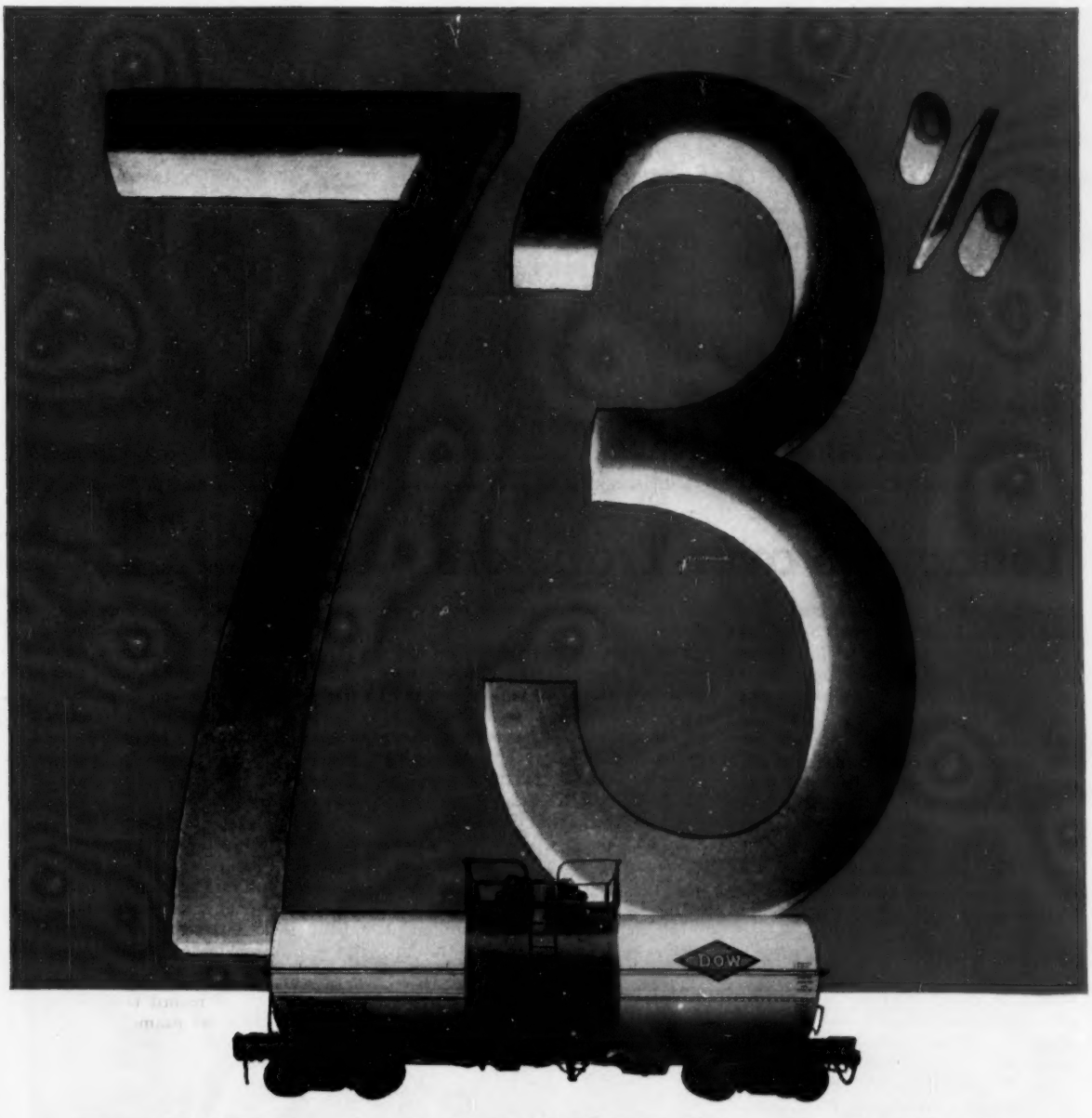
SASOL isn't the only bud on Union's growing chemical tree, either. South Africa, thanks to a recent venture in the manufacture of chloromycetin, will soon be in a position to think about export possibilities in the pharmaceutical field; other drug-manufacturing moves are also in the offing.

One Thing Leads to Another: Such steps forward, naturally, are instilling confidence in the young South African chemical industry. "Whereas some months ago we found it difficult to round up sufficient capital to even start construction work," notes one Union basic chemical producer, "today offers of capital assistance are rolling in."

Successful uranium recovery—from South Africa's famous gold mines—has added to the anticipation of "the coming of the chemical age in South Africa," and has likewise done much to create a healthy climate for investment from abroad.

Behind the recent increase in sulfuric acid output, for example, was the greatly increased demand from gold mines—which need tonnage quantities of acid for their uranium processing. "It just wasn't economically sensible," says one South African government man "to rely on overseas supplies of this workhorse chemical when we have all the necessary raw materials here at hand. Market limitations have been the big stumbling block heretofore. Now that we have the uranium industry, it isn't hard to sell local and foreign investors on the advisability of putting in production units."

Relative Importance: No one can chart precisely just how fast the South African chemical industry will continue to grow. But once SASOL gets in full production early next year, South Africa might well need to import less than one-fifth of the basic and intermediate chemicals now purchased from U.S. and other foreign sources (*see chart*). That in itself is making U.S. producers take stock of what's happening. That within a very few years, Union producers will be direct competitors in some world markets also savors of the plausible and imminent.



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WHERE PICKETING PERSISTS: At Louisiana salt plant, peak production despite few strikers' refusal to face facts.

Tenacious over Transfers

They're setting new production records at the Jefferson Island Salt Co.'s plant near the Louisiana Gulf Coast this week, and townspeople have stopped talking about the strike that was fought with lawsuits, dynamite and bullets; but every day, one of the few remaining members of Local 28, International Chemical Workers Union (AFL) is assigned to a lonely vigil as picket at the plant's main gate.

It was a costly experience for all concerned: the company lost at least two months' production and a number of skilled employees; all of the strikers lost at least two months' pay and many of them lost their jobs; a dozen or so persons—mostly nonunion workers—were injured and many persons' homes and autos were damaged; and the local union has all but shriveled into nonexistence.

In retrospect, it appears that a slip-up in communications can be blamed for the whole affair. It all started back in Aug. '52, when the company transferred two senior plant employees to new jobs and abolished their old jobs. Union members insisted that this looked like a threatened move on the part of the company to lay off its older employees by gradual steps. Numerous meetings between company and union officials prior to the strike failed to bring agreement; and the 250 workers set up picket lines that kept the plant shut down for two months.

Failure to Heed: Observers criticize the strikers for disregarding the terms of their contract, the pleas of their employer, the decisions of the state courts, and even the advice of their own union officers.

For practical purposes, the strike was lost when the state district court ruled that the union contract had been abrogated by the failure to have the dispute arbitrated. The company made repeated efforts to get the strikers back to work, then decided to reopen the plant with nonunion labor if necessary.

"We realized," Asst. Works Manager R. D. Rudolph told CW, "that it was necessary either to open the mine again or to go out of existence as a company. This is the only mine owned by the company, and idle equipment in this climate deteriorates so rapidly that it would have been necessary to re-equip the plant completely had we waited much longer."

Preston Delcambre, president of Local 28 and who recently was elevated to 8th vice-president of the parent ICWU, publicly stated that he had asked his members to go back to their jobs, but that they had refused. He said the strikers were still demanding that the two men who had been transferred be reinstated in their former positions.

For the chemical industry, this has been one unfortunate exception to a generally smooth record of labor relations—and also, an example of what can ensue from a misunderstanding about two standard contract provisions: transfers and arbitration.

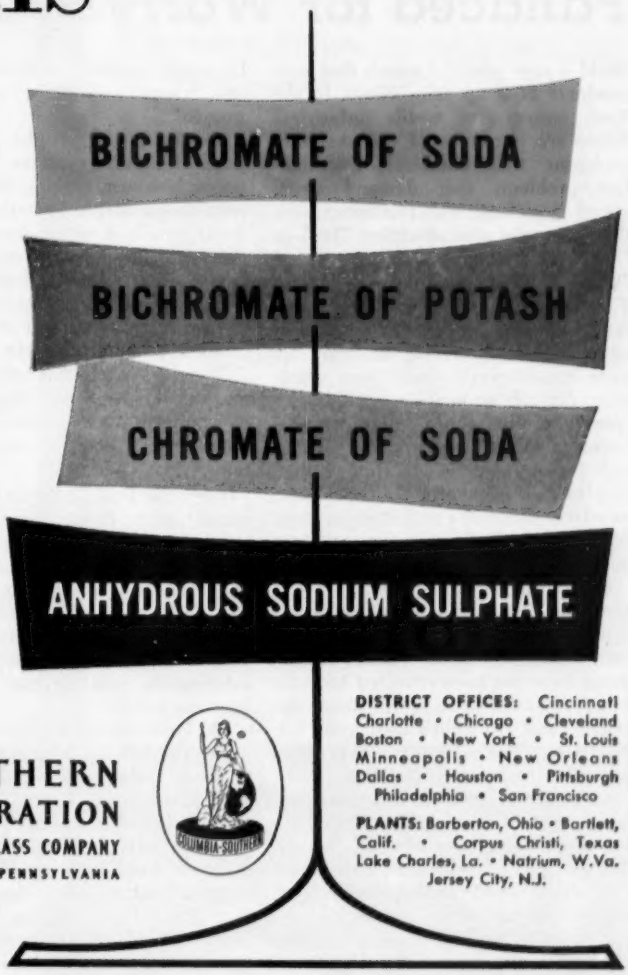
WHAT DYNAMITE DID: For nonstrikers, violence despite court's decision.

Announcing Columbia-Southern® Chrome Chemicals

As previously announced in many news columns, the plant and facilities of the Natural Products Refining Company of New Jersey have been acquired by Columbia-Southern. The production of various chrome chemicals is being continued and shipments are being made from the plant at Jersey City, New Jersey.

The personnel of the former company is being retained and fully utilized. This staff is being augmented by Columbia-Southern personnel who bring with them the background of over fifty years' experience with industrial chemicals. The combination is one which will assure highest quality products and service.

Columbia-Southern welcomes the opportunity of serving your needs for chrome chemicals. Your inquiries will receive prompt attention.



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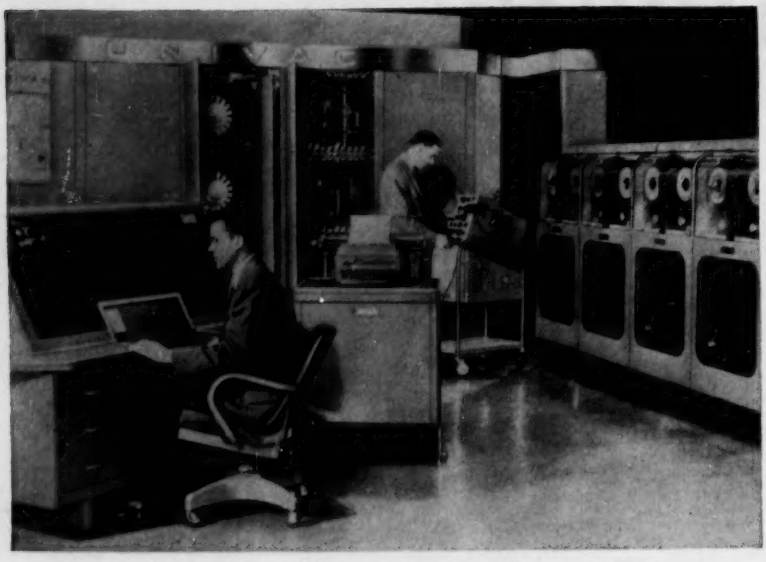

UNIVAC SYSTEM includes (L to R) control console, computer, uniservos.

Panacea for Worry?

Build a new plant? Launch that new product? Step up sales efforts in the food, cosmetic or textile industries? These are but some of the everyday problems that chemical executives face—problems that demand swift, sound decisions. But few executives there are who after deciding "Yes" or "No" aren't tormented by a wisp of "Was-I-right?" wondering.

That's why, in part at least, chemical executives are now pushing intuition into the discard, driving on lining up more information to help them reach calm, profitable conclusions. Outdated operating reports are going by the board; the emphasis is on projections and forecasts of what's impending. And to draft the projections—to sift, correlate, interpret a multitude of facts and factors—they're turning to "electronic brains."

One of the largest "brains" in use today is the large-scale digital computer (Univac) that Du Pont has rented from Remington Rand. (Terms of the rental have not been revealed but the unit is reported to be worth about $1 million, and Du Pont's lease runs for two years.) The computer is at present housed in the Louviers Building, headquarters of the company's engineering department, at Newark, Del. But while the engineering department, which already has considerable experience with digital and analog computers, will provide part of the operating staff, the computer will be used primarily for business purposes—by Du Pont financial experts, economists, market researchers and other management people.

Du Pont will put the general-purpose computing system through its paces, however, seeking other areas of possible profitable operation. Because it can handle a tremendous volume of data with dispatch, the machine is expected to provide better, faster, cheaper results. Significantly, it should furnish information that would be too costly to procure otherwise.

The device, which is fed information and delivers results by magnetic tape, can perform mathematical and logical operations without human intervention.

Versatile Tool: With its tremendous speed and facility for following through a series of complex operations, the computer should streamline clerical and accounting operations, reduce direct dollar costs. But more important, it will provide management with a powerful new tool to project current information and forecast significant business trends.

Du Pont will use its Univac for payrolls, production scheduling, inventory controls, plant cost accounting, personnel statistics, financial statistics, sales and market forecasting.

As the impact of electronics is felt in business, it will profoundly change the nature of management reports and controls. Up to now, the emphasis in reports has been on summarizing operations already completed. In attempting projections, seasoned executives had to take it from there, making their own educated guesses. Forecasting required such staggering statistical work that it was almost impossible to project data economically or promptly enough to be of value.

The advent of large-scale digital computers is changing all this. Once human ingenuity has defined business problems in language a computer can understand, the electronic device takes over, spews out useful management information.*

In the chemical industry, with its flexible processes and broad array of products, production planning, for example, is overwhelmingly difficult. Schedules must frequently be altered because of engineering changes or to keep pace with fluctuations and anticipated sales. Meeting these successive crises requires enormous work and is extremely costly. Now the electronic computers open the door to closer production control than heretofore possible.

Forecasts Markets: Even more significant is the promise of comprehensive and timely sales analyses and market forecasts. Such statistical analysis, in which masses of data must be reduced to tables and specific trend curves, can be deftly handled electronically. For example, a market analysis involving over 600,000 sales records a month can be processed into 1000 tables listing sales prices by type of outlet and indicating volume of sales at different price levels. Another advantage: all factors influencing a market forecast can be included, not just the major ones. (In the past, omitting less important factors to simplify the work has distorted an entire forecast.)

Closely tied as it is to such other major industries as food processing, metals production, rubber and agriculture, the chemical industry is quickly effected by any changes in these other businesses. Such changes can be predicted by electronic computing. For chemical management, the electronic era heralds not only savings in time and money, but also more solid information on which to base sound decisions.

Far less tangible, but equally important: use of electronic brains may reduce nervous turmoil—help quell that perennial management fret "Was I right?"

* The computer is, however, unemotional and its predictions are no better than the information with which it is fed. During the Truman-Dewey Presidential campaign, for instance, one TV network used a computer to predict the election outcome. (By feeding in early returns.) The computer, unemotionally forecast a Truman victory. The operators, somewhat more emotional, couldn't believe the prediction, hastily adjusted the controls, and neatly thwarted the electronic brain's brainpower.

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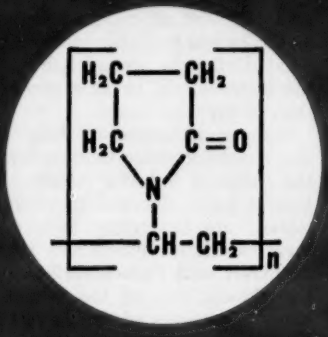

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From Research to Reality

No Injuries Inferred

Coming into clearer focus this week: the new "rule of reason" on exclusive dealer contracts, as applied by the Federal Trade Commission. The agency has just given the chemical process industries two new illustrations of how it's using that rule in enforcing the Clayton Act's ban on tying agreements:

- In one, FTC's Lowell Mason ruled that exclusive dealing contracts signed by Revlon Products Corp. with its beauty supply jobbers, requiring them not to deal in competing products, violates the law.
- In another decision, again written by Mason, FTC set aside its examiner's decision that tying contracts used by the Insto-Gas Corp. of Detroit, tying leasing of propane gas cylinders to the sale of its gas and appliances, violates the same law. FTC ordered rehearing in this case, calling for more evidence before making a final decision.

Positive Proof Required: Like two other rulings on exclusive dealing in the past year (Maico Hearing Aid Co., Harley-Davidson Motor Co.), FTC in the two latest actions found violations where actual competitive effect of the contract was shown, but refused to go along with findings of violations where this effect was not demonstrated. This is the shift announced in the Maico case, the first in the series written by Mason: Injury to competition will not be "inferred" merely because the company using exclusive dealing or tying contract occupies a "substantial" share of the market; rather, FTC will find a violation only when actual injury to competition also is proved.

In the Revlon case, Mason found that contracts binding jobbers to deal exclusively in Revlon nail enamels and related manicure products actually closed these accounts to the nail enamels made by competitors. Certain of the 156 Revlon jobbers stopped buying competitors' products because of the contract agreements. In addition, Mason found that Revlon, the largest seller of quality nail enamel handled by beauty shops, dominates the field.

Mason said the evidence shows that in order to crack the cosmetic market successfully, acceptance of a product in beauty shops is of prime importance, and access to the jobbers supplying beauty shops is thus essential. Mason ruled that, in light of this, plus Revlon's market position ($1.5 million in sales through jobbers in 1949) and the number and importance of the jobbers tied up by its contracts, the agreements will substantially lessen competition if allowed to continue in effect.

WIDE WORLD

FTC'S MASON: In exclusive dealing cases, a new test of legality.

Record Found Bare: In the Insto-Gas Co. case, however, Mason ruled there just wasn't enough evidence to show what effect the tying agreements had on competition. He said the record was so "devoid of facts . . . that we have no choice but to disagree with the examiner."

The evidence firmly established existence of a tying agreement between wholesalers and users of propane gas cylinders made by Insto-Gas (requiring sole use of Insto-Gas propane and equipment). But Mason found no evidence supporting a finding that any market actually was being foreclosed to competitors. Insto-Gas' market position was not shown, nor the amount of gas and equipment actually sold under the tying contracts. Neither were there figures showing the number or size of Insto-Gas' competitors

The Revlon company is already asking for reopening of its case. It wants to reargue the whole thing on two grounds: that new evidence throws a different light on the "stale" evidence relied on (the contracts were signed in 1948), and that actually, access to jobbers is not essential to success in the cosmetic business. Revlon, if it gets the chance, wants to show FTC that Hazel-Bishop, for instance, has grown and done very well in the cosmetic business without relying on jobbers at all, selling direct to consumers instead.

The same business principle—exclusive dealer contracts—appears to be headed for a court test in another industry. Two independent auto dealers in Waterbury, Conn., have filed a $1.25-million antitrust suit against the "big three" auto manufacturers and their franchise system.

Pause Before Climb

Further expansion of Germany's chemical industry will hang on the development of basic chemical output, Government officials in Bonn have decided. Although over-all chemical production and sales will probably increase somewhat during the second half of 1954 the increase will be at a slower rate than in previous years.

German industrialists, fully aware that the deceleration in growth rate of the chemical industry results from a lack of basic chemical producing facilities, are struggling to overcome their handicaps. Farbwerke Hoechst, Frankfort, and Farbenfabriken Bayer, Leverkusen, two of the largest successor companies of the former I. G. Farben combine have launched major expansion plans within the past few weeks. Each will spend DM 100 million ($24 million) before the end of 1954 on expansion projects.

Smaller companies, however, are complaining that a lack of capital makes it impossible to build new basic units now. Their plaint: the "current restrictive outlook for German chemical markets is making investment money harder to obtain; moreover, money's to be made through sale of consumer goods—not basic chemicals."

Production records for the first half of 1954 are, however, far from unimpressive. Included (in tons):

	1st Half 1953	1st Half 1954
Sulfuric acid	741,740	821,421
Hydrochloric	54,479	67,513
Chlorine	151,099	175,999
Caustic soda	204,275	245,507
Nitrogen	289,641	338,081
Calcium carbide	360,945	375,016

But chemical men in Germany are saying, that despite the rise, producers must concentrate on building more basic units *now*. "This last gain has been registered," admits one company director, "through straining all existing capacity to the limit."

"Nobody knows—as well as the consumer of basic chemicals in West Germany today—just how tight the situation is," observes another. "In recent months, although our raw material suppliers have been struggling hard to meet their commitments, we've been living from week to week. Such piecing out is making increased production of export items more and more difficult."

"The current boom in trade is just about over," agrees a third. "To advance solidly, Germany must pause now to build new basic chemical plants. Then it will be ready for additional strides ahead in world markets."

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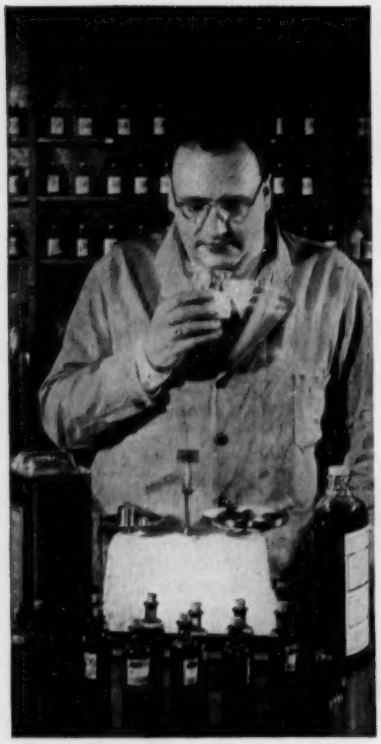

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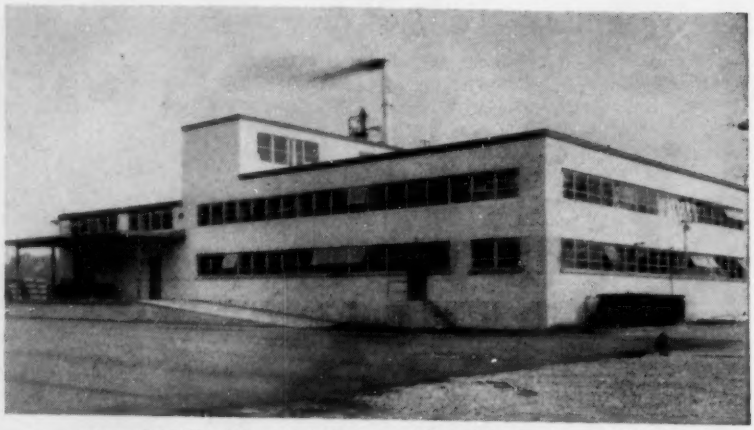

NOW ONSTREAM: Atlas' food emulsifier plant at Brantford, Ont.

FOREIGN . . . . . .

Industrial Emulsifiers/Canada: Production of ester-type food and industrial emulsifiers has started at Atlas Powder Co., Canada, Ltd.'s Brantford, Ont., works. Capacity, company officials say, is large enough to supply the emulsifier needs of the entire Canadian baking industry. Additional expansion is being planned—a second unit to produce ethylene oxide derivatives.

•

Pharmaceuticals/India: No foreign chemical company will be allowed to build a plant in India unless it manufactures drugs not produced in that country, if the Indian government accepts the recommendations of a Pharmaceutical Inquiry Committee in New Delhi. The committee, set up two years ago, has been investigating the Indian drug industry, complaints of local manufacturers against "unfair foreign competition," and the need to enforce ethical standards.

Meanwhile, expansion of pharmaceutical facilities—both Indian and foreign—is at a virtual standstill, awaiting the government's next move.

•

Sulfur/Peru: Fluor Peruana S.A., wholly owned subsidiary of the Fluor Corp., will build a sulfur refining plant in Peru's Tacna Dept. Preliminary plans call for a pilot plant, to be followed by a mill with a 100-ton/day daily capacity. Cost: $600,000-800,000.

•

Hormones/Argentina: Merck (North America) Inc., which since 1950 has been supplying 95% of Argentina's requirements of cortisone and hydrocortisone, will now put up a plant in Buenos Aires to produce both hormones. Booked as a $200,000 investment, the plant will employ U.S. technicians, will be in operation within the next 18 months. Some 50 U.S. firms will furnish necessary equipment.

•

Red China Trade: It's now being reported in Hong Kong that Red China government agencies are placing orders for fertilizers, dyestuffs and pharmaceuticals valued at over HK $1 million. Although the dollar value isn't particularly striking, it's significant, Hong Kong officials point out, that this is the first time in many months that orders have been placed by Peiping agencies directly through Hong Kong agents—rather than by cable to European manufacturers.

•

Importers/Central America: Importers in Central America representing U.S. firms are complaining bitterly these days that they're being outsold by European and Japanese manufacturers. Their prediction: that when detailed import statistics are made available (Jan. 1, '55) it will show that U.S.-made chemicals have suffered a substantial decline. Major friction point: U.S. exporters—on the whole—will not extend credit to Central American distributors, and will ship only on letter of credit. European companies, on the other band, customarily grant 90-day credit extension.

•

Fatty Alcohols/France: Sinnova, S.A. has started production at a second fatty alcohol unit at its Toulouse, France, plant. Capacity: 600 tons/month—approximately one-quarter of France's current consumption of fatty alcohols.

•

Pharmaceuticals/Denmark: Ferrosan Corp., one of Scandinavia's largest producers of pharmaceuticals and insecticides, has expanded its Gladsaxe plant "to meet steadily growing export demand."

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WIDE WORLD

CIO'S GOLDBERG: For unions' antitrust immunity, hands-off policy asked.

LABOR . . . . . .

'Nothing for Nothing': Chemical labor unions that have been emphasizing fringe benefits in their 1954-55 bargaining are chided by the words of Ralph Lounsbury, new president of the American Life Convention, an association of 243 legal reserve life insurance companies. In his president's address at the group's recent meeting at Chicago, Lounsbury declared:

"Any money taken out of a manufacturing concern or other business in order to provide group annuities, pensions or other benefits is taken from funds that might go for current income to workers if it were not otherwise diverted. It adds to the cost of the product produced, and the worker ultimately pays for it, whether he thinks he does or not."

•

Strike Averted: Canada's synthetic rubber industry has narrowly escaped being upset by a strike. By vote of 1228 to 69, members of Local 14, United Gas, Coke & Chemical Workers (CIO), authorized their bargaining committee to call a strike against the government-owned Polymer Corp. at Sarnia, Ont., if deemed necessary. Only a day or so later, the union members voted by 600 to 532 in favor of accepting a company offer for a two-year contract with a 4¢/hour wage increase for the first year and a 3% increase for the second year. Present basic wage rate is $1.35/hour.

•

Don't Look Now: The CIO, it seems, doesn't even want people to consider the possible desirability of ending the labor unions' present immunity from certain parts of the antitrust laws. Last week, it became known that Attorney General Herbert Brownell's special committee to study the antitrust laws wants to look into that matter; and CIO General Counsel Arthur Goldberg has promptly written to Brownell asking that he "issue public instructions" forbidding that move.

•

Construction Work Stalled: Some 3700 AFL Boilermakers in five Southwestern states have been striking for a 10¢ wage increase that would bring the journeyman boilermaker's pay rate to a flat $3/hour, plus an employer's contribution of 7½¢/man-hour into a new union welfare fund. The strike was called in Texas, Louisiana, Arkansas, Oklahoma and New Mexico, and has interrupted construction work at a number of chemical and petrochemical plant sites along the Gulf Coast. Contractors have agreed to the base pay increase, but are balking at the welfare payment demand.

•

Employers Accused: At the same time he announced appointment of a "watchdog committee" to police the administration of member unions' welfare funds, CIO President Walter Reuther charged that the most lucrative corruption in this field "is in the splitting of fees and kickbacks that take place among the employers and insurance companies." Reuther promised that when CIO finds welfare funds being mishandled, it will take corrective action immediately, without waiting for the case to be tried in court.

•

Union Bid Rejected: Employees at Foote Mineral Co.'s newly expanded lithium unit at Kings Mountain, N.C., have turned down by 131-to-21 vote the bid of the United Steelworkers (CIO) to serve as collective bargaining agent there. Plant Manager J. E. Castle says the present 215-man payroll will be increased as production gains.

•

Copper Cut Again: Another crimp in U.S. copper supply is the word from Utah, where two locals of the United Steelworkers (CIO) have struck at refineries of American Smelting & Refining and Kennecott Copper at Garfield. This forced Kennecott's Utah division to lay off 100 miners, cut back operations to a four-day work-week, and ship its concentrates to refineries in other states.

•

Voluntary Pay Cut: In one chemical process industry, a labor union has consented to a wage reduction to help

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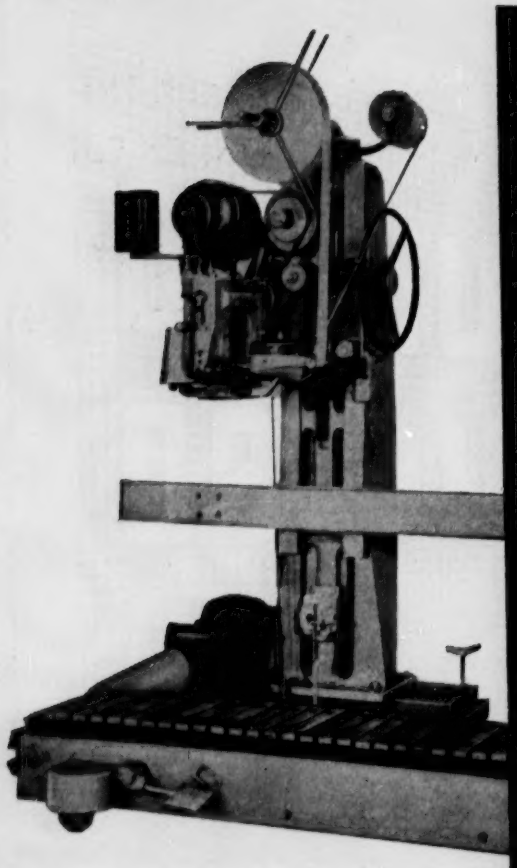

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keep the employer from going out of business. After members of Local 519, United Paperworkers (CIO), had voted by 91-22 to take a voluntary 10% pay cut, management of the Victoria Paper Mills Co. announced the plant at Fulton, N.Y., would be reopened. Officials had stated that the company couldn't keep operating under the former wage schedule. A plan has been filed in federal district court for full payment of all creditors.

•

Atom Workers' Wages: Next week will see expiration of the Taft-Hartley injunction against the strike by some 3500 members of the United Gas, Coke & Chemical Workers (CIO) at the atomic energy installations operated by Union Carbide's Carbide and Carbon Chemicals division at Oak Ridge, Tenn., and Paducah, Ky. Negotiations are being resumed right at the point where they broke off in August, when the union rejected the company's offer of a 6¢/hour wage rise.

Old Theme, New Tack

In a move calculated to round out the government's study of the always-with-us scientific manpower problem, the Office of Defense Mobilization last week named James R. Killian, Jr., president of Massachusetts Institute of Technology, to head a panel of engineers and scientists to "study methods to mobilize U.S. scientific resources in the event of an emergency."

Men from industry, universities, and government will fill out the panel, which is expected to survey—among other facets of the question—the nation's current research facilities. For organizational reasons, the Killian group will work under ODM's Science Advisory Committee, headed by Lee A. Dubridge, California Institute of Technology.

Also under the Dubridge Committee (and expected not to overlap with Killian's work) is an interagency group—working up recommendations on how to (1) increase university registrations, (2) improve college's technical curricula.

Current thinking in Washington on the entire manpower question now seems to be falling into a clear pattern. Caught short by two national emergencies since 1941, government officials are determined to scrutinize all angles of the mobilization problem now—preparatory to any outbreak of hostilities. Reason: "intensified military action in the future will not even allow time for improvisation."

Also high on the list for implementation soon is ODM's plan to establish a roster of executives. A nationwide

WIDE WORLD

KILLIAN: Due to study scientific manpower question afresh.

canvass of available personnel will be made with the aid of national scientific organizations, trade groups, and labor unions who will propose candidates for the 300-odd posts under ODM direction. From this preliminary list ODM will select the most likely men and consider the advisability of offering them annual training sessions.

Backing the plan to bolster scientific manpower reserves in recent weeks have been a host of national associations. National Planning Assn.'s Special Committee on Manpower Policy, for example, is impressed with the need for immediate further action by ODM. Its position: it's of vital importance to U.S. security.

LEGAL . . . . . .

Race for Trademark: Two toilet-goods makers are involved in one of the current controversies in the U.S. Patent Office over trademark similarities. The agency is trying to decide whether it should register "LANOFOAM" as the trademark for a shampoo made by Hair-Kare Co., Chicago; or "Lano Foam" (in script letters) as the trademark for a men's hair grooming preparation made by Bostwick Laboratories, Inc., Bridgeport, Conn. Hair-Kare contends that it should win the point, having filed its application one month ahead of the Bostwick request.

•

Real Estate Clash: It looks now as though the U.S. Supreme Court may have to determine whether the federal government or the state of Louisiana will be the landlord for the companies buying oil, natural gas, and sulfur leases on the undersea lands lying

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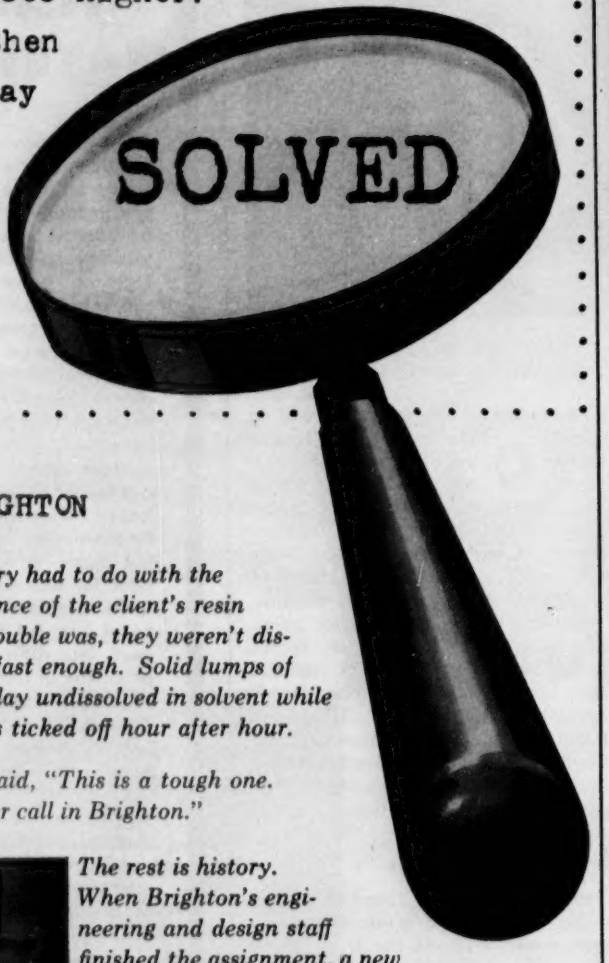

By BRIGHTON

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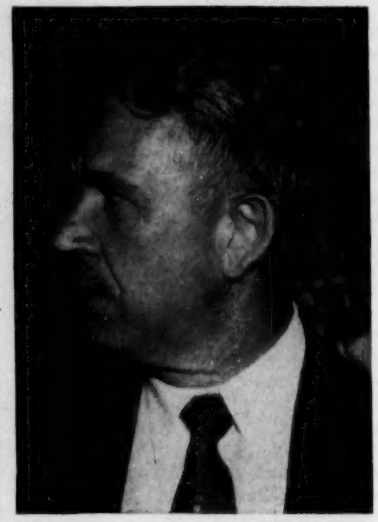

WIDE WORLD

GOV. KENNON: For state equality in oil and sulfur leasing, he stands firm.

between 3 and 10.5 miles off the Louisiana Gulf Coast (*CW, Sept. 25, p. 13*). Louisiana's Gov. Robert Kennon and his staff are holding firm to the principle that their state should have the same off-shore boundary limit that's recognized for Texas and Florida. At present, there's a tentative working arrangement between the state government and the U.S. Dept. of the Interior: bids for leases in the disputed area will be rejected unless federal-state agreement is reached before the date of sale; and if necessary, proceeds will be impounded until the Supreme Court decides on title to the off-shore realty.

•

Silo Suit: Why a clay silo collapsed at the Owensville, Mo., plant of Allied's General Chemical Div. is at issue in that company's civil suit against Natco Corp., Pittsburgh. Allied charges that because of the contractor's "faulty and improper workmanship and materials," the silo collapsed shortly after Natco ended a repair job on it, and asks judgment for $28,377.52 plus interest and court costs. Natco has replied with a general denial and a move for dismissal, asserting that any damages that plaintiff may have sustained were caused or contributed to by its own carelessness or by the negligence of some third party.

•

Pricing Case Pleas: In two pricing actions of interest to chemical process companies, the Federal Trade Commission has handed down one precedent-confirming order and received a plea for making a new policy decision.

• In the steel drum case, FTC has reaffirmed its policy of not allowing

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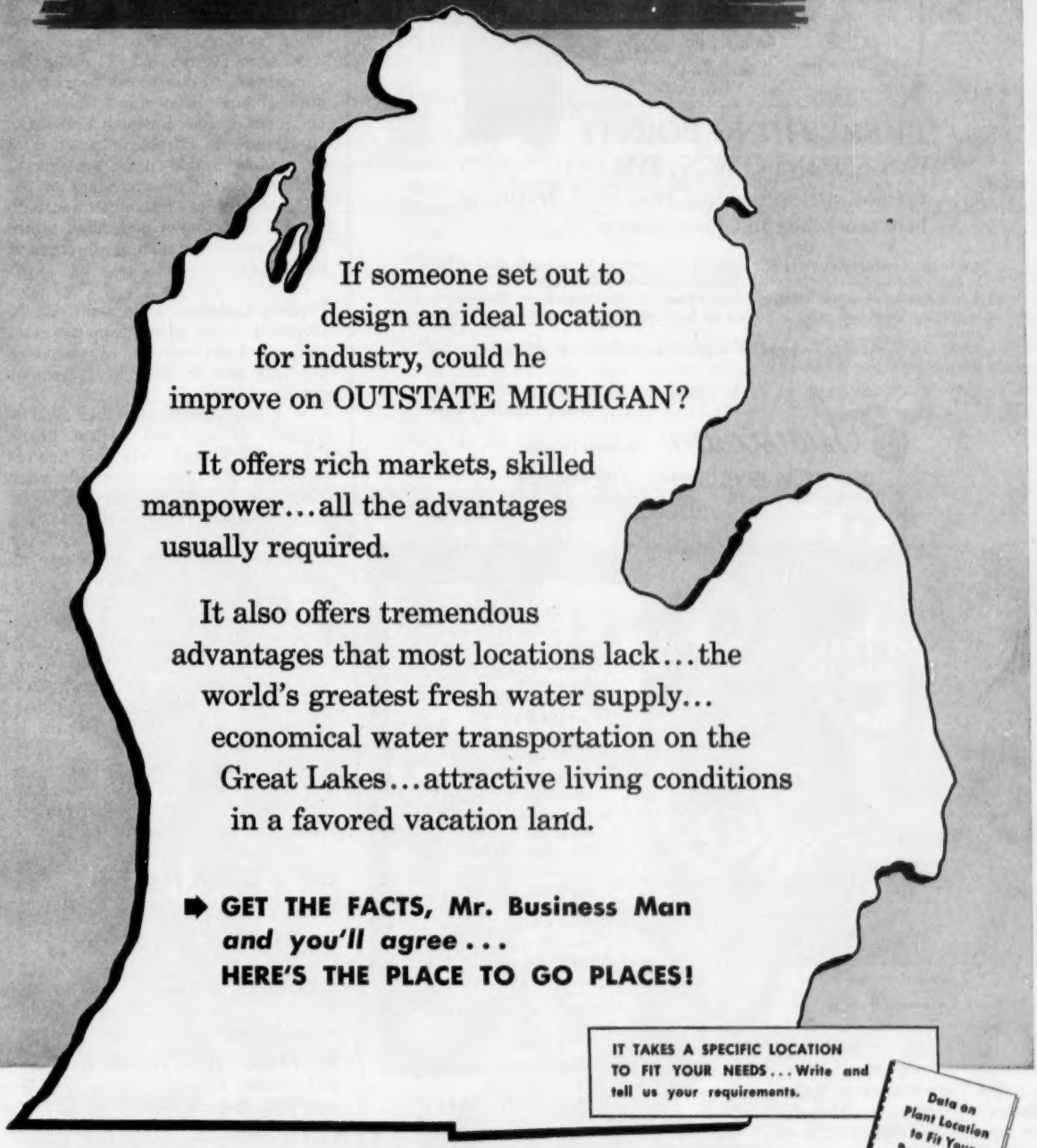

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suppression-of-competition cases to be settled through informal agreement. The commission unanimously turned down the motion by U.S. Steel Corp. and four other steel drum makers for an order permitting a stipulation settlement. The complaint accuses these companies of engaging in an unlawful combination and in unlawful price-fixing practices.

• An FTC counsel is asking the commission to overturn a hearing examiner's order dismissing a "fair-trade" complaint against Eastman Kodak Co. In dispute is Eastman's practice of negotiating resale price agreements with retailers that—according to the FTC counsel—are in competition with the 35 company-owned retail stores that Eastman maintains throughout the country.

•

Product Liability: There's no end to litigation over alleged injuries and damages from the use of consumer products (see p. 20). In prominent pending cases:

• A Sacramento man has filed a $25,000 damage suit against Baker Castor Oil Co. of California (manufacturer), F. Lagomarsino & Sons (distributor), and the Elwood Kuhn nursery (retailer), contending that dust from the castor bean meal fertilizer he bought from Kuhn caused him to develop asthma and bronchitis.

• In a Pittsburgh woman's lawsuit against the maker of Clairol shampoo, Clairol is asking that the case be transferred from federal court in New York to federal court in Pittsburgh "for convenience of witnesses and in the interests of justice." The plaintiff is opposing the move on grounds that since the case could not have been filed in Pittsburgh, the defendant might be able to have the suit discontinued if it were moved there.

KEY CHANGES. . .

W. F. George, to special assistant to the president, Witco Chemical Co., New York City.

William P. Gage and **Marlin G. Geiger,** to vice-presidents, W. R. Grace & Co., New York City.

Birny Mason, Jr., to assistant secretary and assistant treasurer, Union Carbide and Carbon Corp., New York City.

Carl H. Hageman, to manager, industrial relations, Union Carbide and Carbon Corp., New York City.

John Geraci, to vice-president in charge of production and development, Gallowhur Chemical Corp., New York City.

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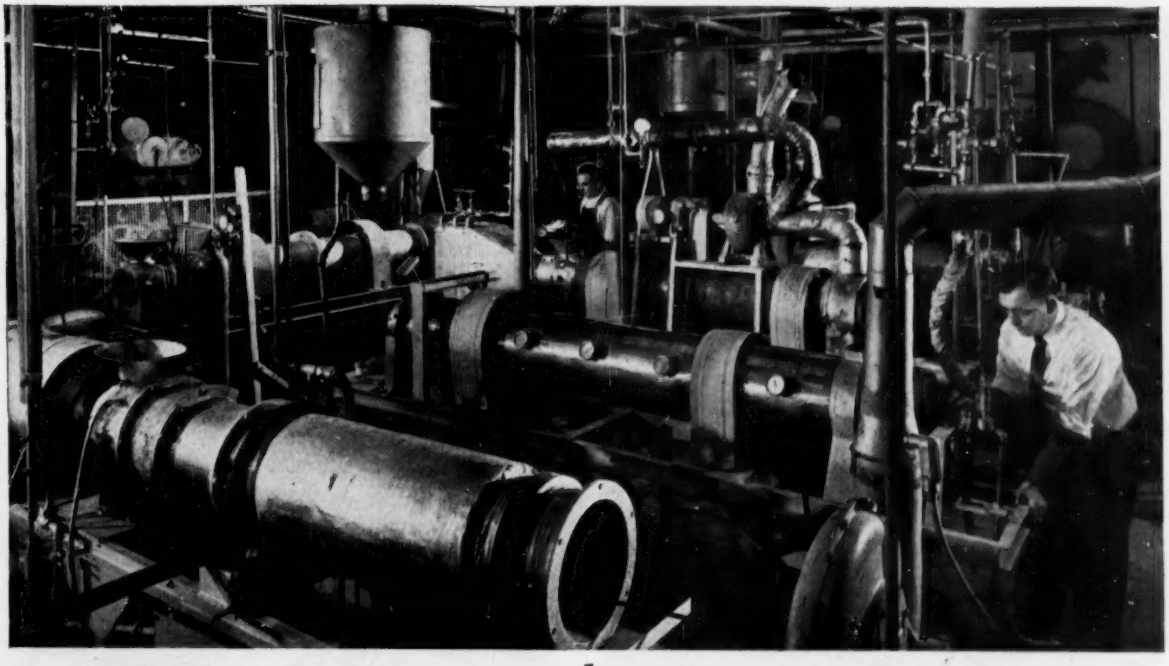

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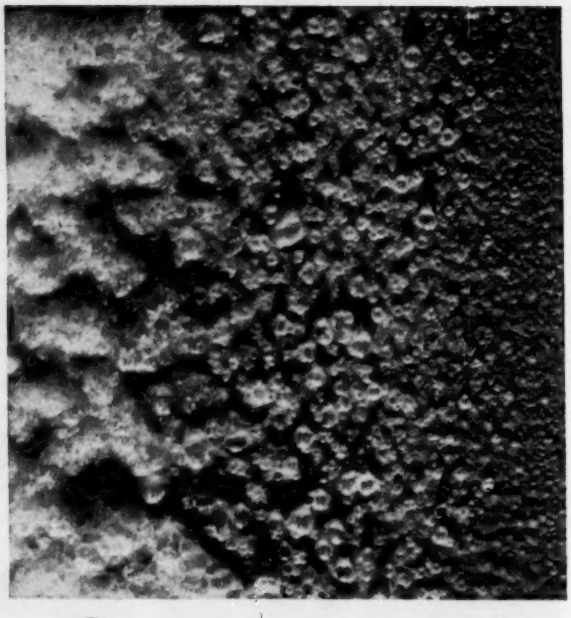
For dependability see General American—creative engineering, design, construction, installation

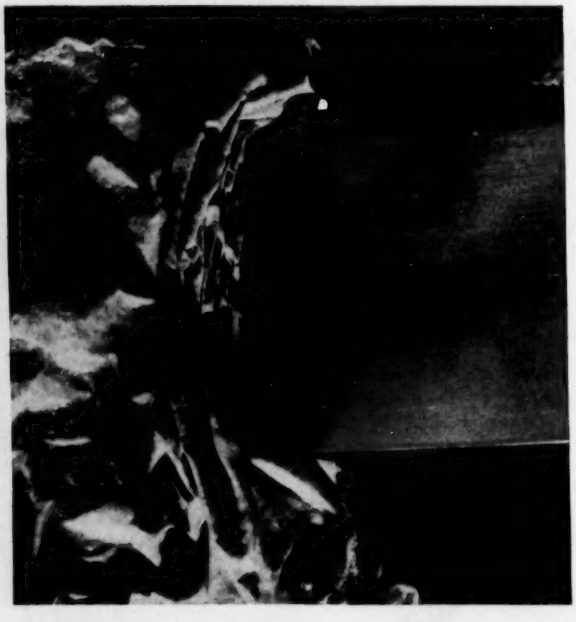
New easy aerosol way

1. **THIS SECTION** of a wooden coat rack carried an old coat of gray enamel over varnish.



2. **FROTHY WHITE** foam of new aerosol paint-remover formulation went to work raising "blisters" as soon as it was sprayed on.

3. **WITHIN 3 MINUTES** of spraying, the aerosol paint remover formulated by Du Pont chemists blistered the enamel severely.



4. **AFTER 6 MINUTES** the enamel was loosened and the varnish dissolved. A putty knife bared the wood.

to remove paint and varnish!

It's another product that benefits from aerosol packaging plus the *right* "FREON"* propellent

This new foaming aerosol paint remover makes a tedious job easier, quicker and cleaner. The foam structure of the deposit retards evaporation of the solvent, and the deposit has the consistency to cling to vertical surfaces. Removal of lacquers and varnishes is easier because the softened coating tends to cling to the foam.

FORMULA DEVELOPED BY DU PONT

Du Pont developed the formula as one of its services to the aerosol industry. The formula is available to interested packagers free of cost. Helping make the product possible is the Du Pont "Freon" fluorinated hydrocarbon propellent in the formula. This particular "Freon" propellent was selected to achieve the precise pressure, stability and particle size needed.

Many products are made better—and better-selling—with aerosol packaging, and your product may be one of them. In 1953 approximately 140 million aerosol units were produced, selling at retail for about $150 million. *This was a gain of 45% over 1952, previously considered a "boom" year!* And the aerosol-product market is still growing.

Most aerosol products on the market today are formulated with Du Pont "Freon" propellents. These products are made under strict laboratory controls . . . are pure and uniform . . . nonexplosive, nonflammable, virtually nontoxic.

SEND FOR FREE MATERIAL ON AEROSOL PACKAGING AND MARKETING

Take advantage of the knowledge of aerosol manufacture and marketing Du Pont has gained in producing "Freon" propellents. We'll be glad to help you with information on aerosol packaging, market-research data or technical assistance. Mail the coupon below today. E. I. du Pont de Nemours & Co. (Inc.), "Kinetic" Chemicals Division, Wilmington 98, Delaware.

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☐ Send market-research data.

☐ I am interested in technical assistance.

Name_____

Title_____

target

A Wood That Won't Warp

When the first door got stuck for the first time, the man trying to open it probably turned and said, in effect: "Wouldn't it be great if they could make a wood that wouldn't swell." Many years and millions of doors later, men everywhere are still making the same observation.

The commercial possibilities of such a product—a dimensionally stable wood—have not, of course, gone unnoticed. For not only would it be a natural in doors and frames, but also it would be used in drawers, windows and sashes, cabinets and other places employing moving parts of wood.

Right now, there are several ways of imparting dimensional stability to wood, but for one reason or another, none is completely satisfactory for widespread application. The Ford Motor Co., for example, licked the problem of shrink-and-swell in wooden dies by using impreg (*CW, June 5, p. 54*), a wood impregnated with a phenolic resin. But despite its unquestionable merits, impreg is too expensive to cut a really big slice of the wood market.

Scores of researchers from the chemical and wood industries, from the government and from universities, have tried their hands with varying degrees of success.

Keeping it Dry: At the very heart of the problem is wood's hygroscopicity; a dry wall cell can absorb as much as 30% of its weight of water. Since there's no way of changing the nature of wood, the problem boils down to finding a way of keeping the water out.

This can be done in either of two ways: by an internal or external coating that seals the moisture out or by injecting something into the wood ("bulking" the fiber) so there's no room inside for the moisture. The first method, at a casual glance, seems the simplest. Unfortunately, however, all known coatings that adhere to wood also are permeable—to a degree, at least—to water. The best that can be done on that score is to slow down the rate of absorption—hence the rate of swelling. Products that do just that can be very helpful in combating sudden changes in humidity; but they're not too effective against slow, seasonal changes.

On the other hand, there are several feasible methods of bulking the fiber. One is to allow the wood to absorb an unpolymerized mix, like phenol and urea. Upon setting, the mix reacts to form a thermosetting resin. This method, developed by the USDA's Forest Products Lab in Madison, Wis., can be carried out either with compression of the wood during the curing (compreg) or without (impreg).

The drawbacks to this method are that it has a tendency to embrittle the wood, consumes a large quantity of resin (up to 30% of the dry weight of the wood) and is not recommended for thick pieces.

Another means of accomplishing essentially the same thing is to acetylate the hydroxyl groups in the wood. Though it's not commercial as yet, acetylation is promising.

All but One: By far the best bet, according to the USDA Forest Lab's Alfred Stamm, is to find a way to promote cross-linking between the cellulose chains or other components of the wood. And Stamm is a man who should know. An ardent researcher in the whole field of wood treatments,* he's tried them all.

A process of treating wood with formaldehyde, for instance, comes very close to filling the bill. When wood is placed in a bath of formaldehyde to which hydrochloric acid has been added, the dry wood absorbs only 3-6% of its weight. Yet dimensional stability is improved by 40-80%.

Unfortunately, the formaldehyde process is like the operation that was highly successful on all counts but one—the patient didn't survive. For the acid needed to catalyze the reaction degrades the wood, and the finished product shows a serious loss of strength.

Stamm has tried other aldehydes as well as ketones (glyoxal, acetaldehyde, benzaldehyde and acetone), but none has been so good as formaldehyde. He's also used other acids as catalysts, but only nitric worked as well as hydrochloric, and its effect was as bad.

Stamm is convinced, however, that the principle is sound. All that's needed is a chemical that will promote cross-linking at a pH considerably higher than 1.0. It should be capable of doing the job by a cheap, quick process.

Taking the Measure: If that sounds like a big order, you have to remember that the stakes are tremendous. Just how big the market would be is a matter of conjecture. But everyone agrees that the size of the market would be dictated by the cost of the treatment to the wood processor; the cheaper it is, the bigger the market. And it would probably increase geometrically rather than arithmetically.

Figures put out by the USDA, though not up to date, give a pretty good idea of the order of magnitude of the market. They show, that in 1948, 2149 million board ft. of lumber went into millwork (sash, frames, doors, molding, kitchen, cabinets, etc.) and 1948 million board ft. went into furniture.

Assuming an average raw material cost to the wood processor of $175/thousand board ft., that represents $376 million worth of millwork, $341 million worth of wood for furniture. A fair estimate is that the man making millwork would be willing to pay 10% of his raw material costs for a treating process that would make wood dimensionally stable, while the furniture maker would go as high as 25%. That adds up to a $123-million-a-year market—just sitting there waiting for the right product.

*A subject he has dealt with at some length in "Chemical Processing of Wood" by Stamm and Elwin Harris.

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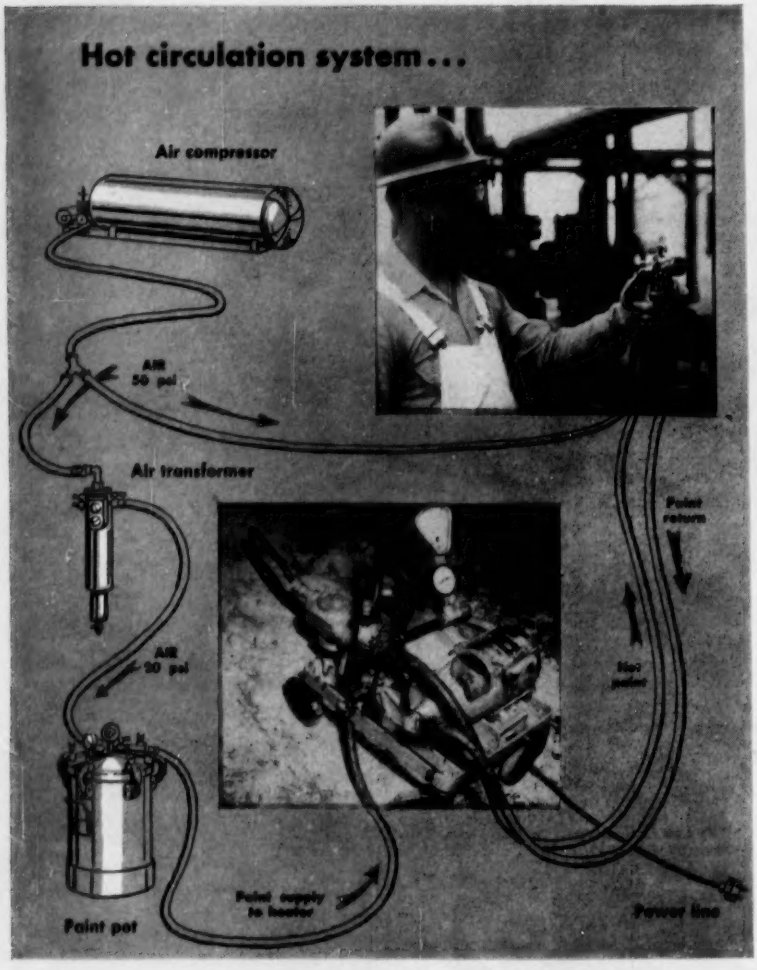
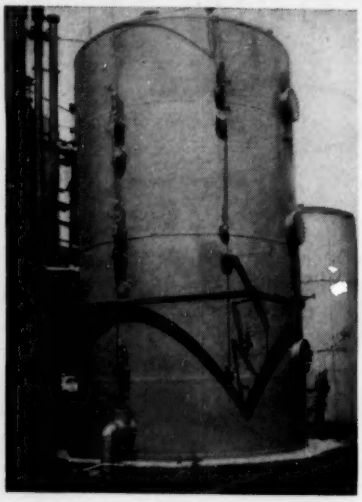
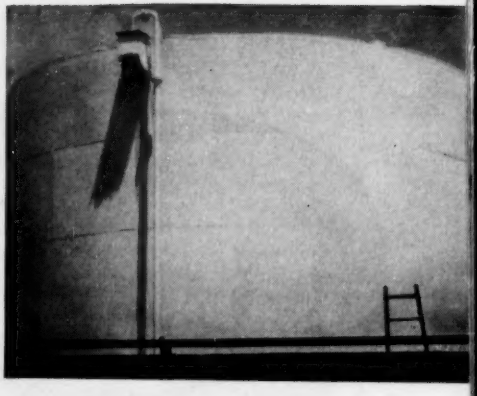


AT THE CORE, heater and pump combine to keep viscosity at a minimum, uniformity at a maximum.





Takes the Chill off Vinyls

Digging down every year into its collective jeans for $2 billion to cover the cost of its preventive painting program, industry has become increasingly receptive to cost-pruning suggestions and coating innovations. One of the most recent of these—from Carbide and Carbon Chemicals Co.—involves vinyl paints that aren't new, a hot-spray application that is. Aimed at offsetting some drawbacks of vinyls, it will find a warm if critical welcome awaiting.

The prime objection to vinyls was the large number of coats needed to build up the necessary thickness (.005 in.); vinyls are not easily brushed on, nor are they easily sprayed on without a lot of thinner. Carbide borrowed a page from the automotive engineer's handbook, tried a portable heater (designed for automotive enamels) in the paint line between the paint pot and the spray gun.

After experimenting at its Texas City, Tex., works, Carbide found the right temperature slot. At 160 F, says Carbide, everything fell into place: where coating thicknesses of ¾ to 1 mil were previously the rule, it's now possible to get three mils per coat; where the job required highly skilled painters, it is now possible to obtain better jobs with less skilled workers and at a lower over-all cost.

At a time when some of the larger chemical plants are spending $0.5 million/year for protective painting, it is difficult to disregard the importance of any potential savings. And according to one estimate, an efficient painting program can pare up to 50% from maintenance painting costs in most chemical process plants.

Warmed-Over Vinyl: Carbide's first heater was an electrically heated, noncirculating unit that was strapped to the spray man. Currently, the company is using two such noncirculating units, eight other models that circulate the paint past the gun and through the heater (*see cut*) when not actually spraying, in order to provide a more uniform temperature for the paint at the gun, and a more uniform job when applied.

The newer circulating units work like this: From a central air supply, air is pressured at 50 psi. along one line to the spray gun, along another to a transformer where it is stepped down to 20 psi. before entering the paint pot. Paint, pushed from the pot at 20 psi.,

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Piccolastic Resins have properties you may be able to use to make your products better and more salable! They can be used in the manufacture of a wide variety of products—adhesives, wire and cable insulation, paper coatings, rubber products, inks, paints and varnishes, textile coatings, gaskets, wall board and many others. Some of the properties that give these resins their outstanding advantages are outlined below.

General Description

Piccolastic Resins are made in five series and twenty-four standard grades. Special grades can be made if desired. The Piccolastic Resins are polymers, in a wide range of average molecular weights, of styrene and its homologues.

They possess sufficient pale color so as to be suitable for the majority of uses. The entire line is soluble in aromatic hydrocarbons.

The Piccolastic Resins, with the exception of one type, are wholly hydrocarbon in structure, and therefore are alkali and acid resistant to a high degree, do not support mold nor other fungus growth, and are not subject to enzyme reaction.

The Piccolastic Resins are permanently thermoplastic, and because of their heat stability at temperatures up to at least 175°C, make excellent, stable, hot melt compounds.

Types and Grades

Piccolastic Resins vary from viscous liquids through tacky solids, brittle solids to resins of hard horny toughness. Intermixtures of the various items permit an unlimited range of properties.

Plasticizers and Solvents

For the various grades of Piccolastic Resins, plasticizers and solvents must be chosen with care. We have developed extensive information on the compatability and action of various materials suitable for such use.

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flows through the heater and is delivered to the gun at 160 F. When not being sprayed, the paint short-circuits, recirculates through a triangle formed by the heater at one angle, the gun at another, and a centrifugal pump at the third. Minus the keystone-angle recirculating pump, the noncirculating circuit is essentially the same.

As a result, says Carbide Maintenance Engineer B. Wright, after hot-spraying vinyl paints over more than 250,000 sq. ft., Carbide found that in addition to greater build per coat and lower labor cost per sq. ft. of surface, it also got:

- A process that works as well on small surfaces with numerous projections as it does on large, flat areas.
- Better finish. Immediate evaporation of the solvent (caused by the elevated temperature) permits deposition of a greater film thickness without sag. Too, there is better film continuity plus a build-up of film thickness on the edges of the work.
- Lower overspray due to reduced pot pressures (20 psi.). This means increased coverage per gallon (i.e., lower spray loss), little damaging drift from overspray settling on other surfaces. Also, working conditions were improved; the hot spray appears to be cleaner and less hazardous than the fog associated with conventional sprays.

There's just one sour note says Wright: only a few conventional vinyls lend themselves to hot-spraying.

Costs of fluid coking†

Using a crude feed from.....	South Louisiana	Hawkins
would require an investment of.....	$2,150,000	$2,300,000
to obtain fractions	valued at*	($/bbl. feed)
C_3 and lighter	$0.07	$0.09
C_4 to 430 F	0.77	0.74
430 F to 1015 F	1.65	1.04
Coke	0.14	0.25
	$2.63	$2.12
The feed would cost ($/bbl.)	$1.25	$0.75
while operating expenses ($/bbl.) would run	0.24	0.24
	$1.49	$0.99
This would leave a profit ($/bbl.) of ...	$1.14	$1.13
with a return (%/year) of ..... (before taxes and royalties).	175%	165%
Adding $5/ton for coke value‡ would increase this(%/year) by	21%	36%

†Estimated figures are based on a 10,000-bbl./stream day unit located along the Gulf Coast and using a vacuum pitch petroleum feed evaluated as a component in #6 fuel oil.

*Values for the products are based upon $0.90/bbl. (F.O.E.) for fuel gas fraction, $3.20/bbl. (F.O.E.) for C_4-430 F fraction, $2.70/bbl. (So. La.) and $2/bbl. (Hawkins) for 430 F-1015 F fraction, and $5/ton for the coke.

‡While the coke is figured for its Gulf Coast value of $5/ton, on the East Coast it would bring in the neighborhood of $10, and for specialty purposes it could bring up to $25/ton if it is of the proper quality.

Heating Up the Leftovers

LAST YEAR Standard Oil Development Co. (Linden, N.J.) told the processing industry how it could get rid of its heavy residual oils by upgrading them to lighter products (*see table*). Last week, at the New York Section meeting of the American Institute of Chemical Engineers, Esso's Frank Barr and C. Jahnig filled in some more details of the company's fluid coking operation. Late this year, Carter Oil Co. (Billings, Mont.) will start first commercial production (*see cut*).

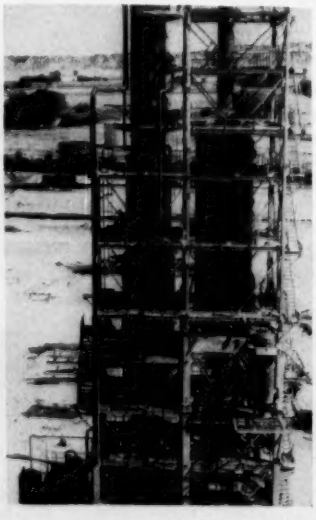
Together with other plants now under way, the Carter unit will produce 200,000 tons fluid coke per year. Compared with current consumption, this figure is small; for example, the U.S. devours 70 million tons/year of metallurgical coke alone. Compared with the mounting stocks of heavy residual oils left over from the refining of gasoline and heating oil, it is promising.

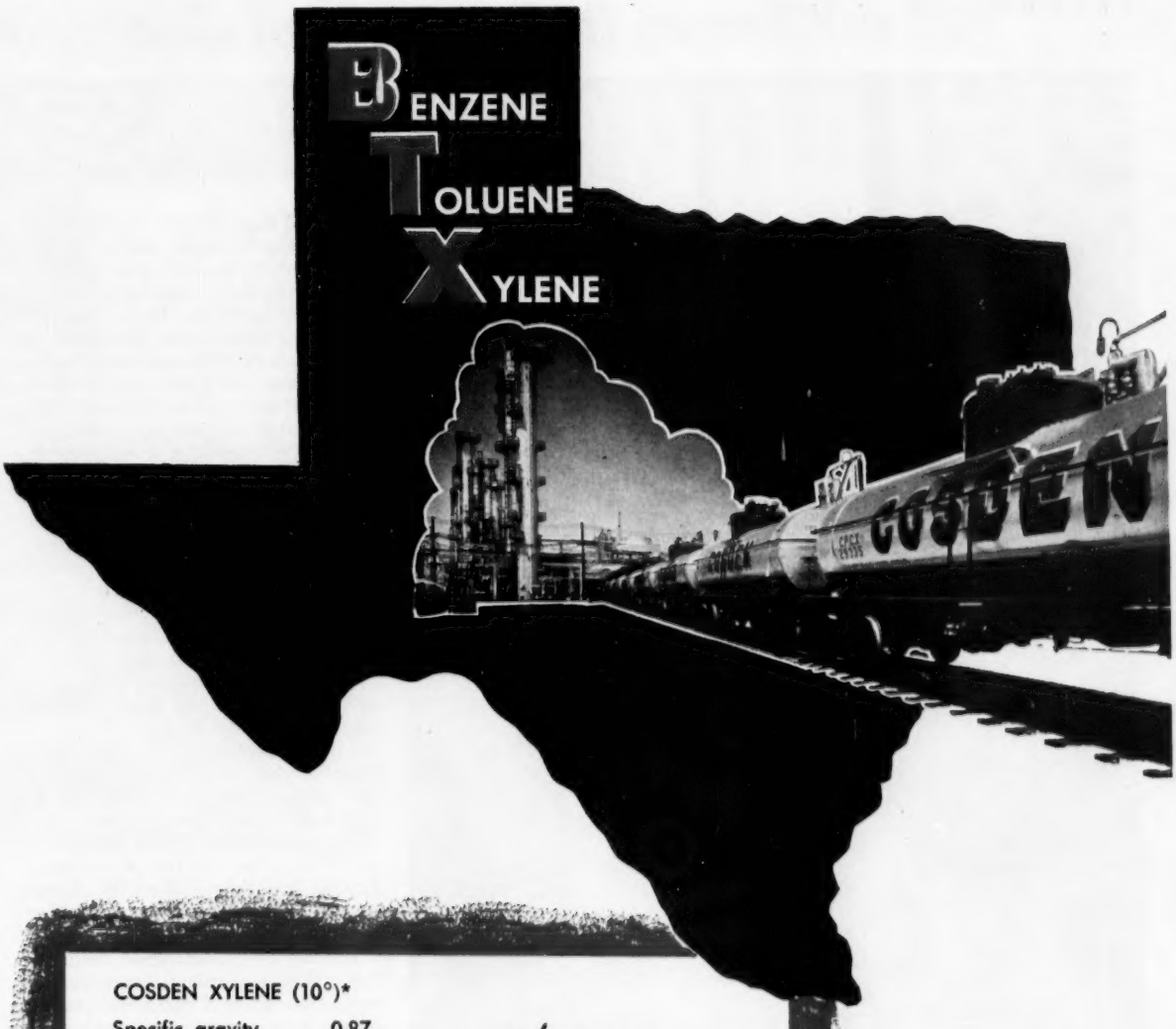
For the past few years, the consumption of heavy oil has not kept pace with the market for gasoline and heating oil, has presented processing men with a problem in output imbalance. This new fluid coke, though it differs distinctly from petroleum coke, has already aroused a great deal of interest, could be a profitable way out (*see table*).

In addition to the coke, the process provides an appreciable amount of naphtha, a maximum of gas oil suitable for catalytic cracking from materials that otherwise might give no distillate products. Moreover, declare Barr and Jahnig, fluid coking will work on any heavy feed that can be pumped.

Essentially the process is an adaptation of the fluid-bed technique to the handling of the residue to form a distillate and the coke. As the Esso researchers point out, complete elimination of the credit for coke has only a minor effect on the economies of fluid coking. But the opportunities for additional profit by getting a premium price for the coke is significant.

For instance, they feel that instead of the $5/ton for the coke on the Gulf Coast, it might bring as much as $25/ton for specialty uses. These uses, however, are still largely in the exploratory stage.





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Acid wash color	0 to 1
Flash (Tag C. C.)	78°F
Paraffins	0.1%
Copper corrosion	pass
Sulfur compounds	nil
Acidity	nil
Odor	Sweet
Color	Water white
Mixed aniline point	11°C
KB value	98
Distillation IBP	136°C
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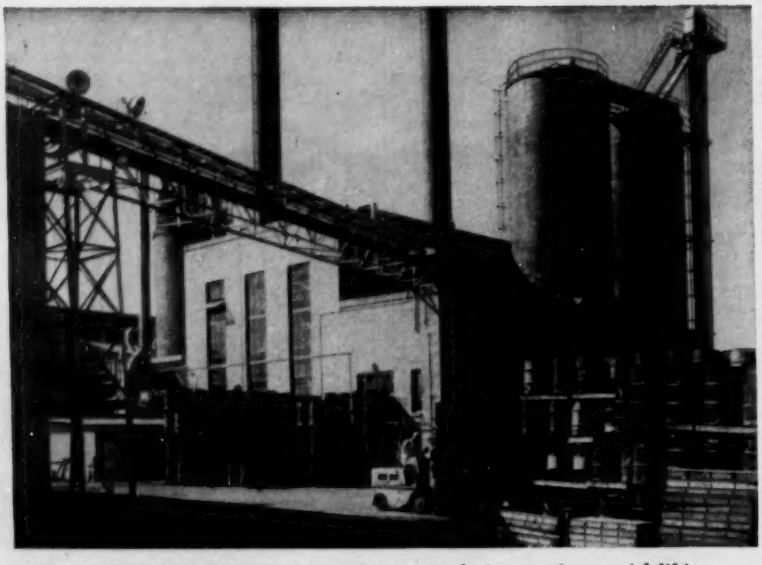
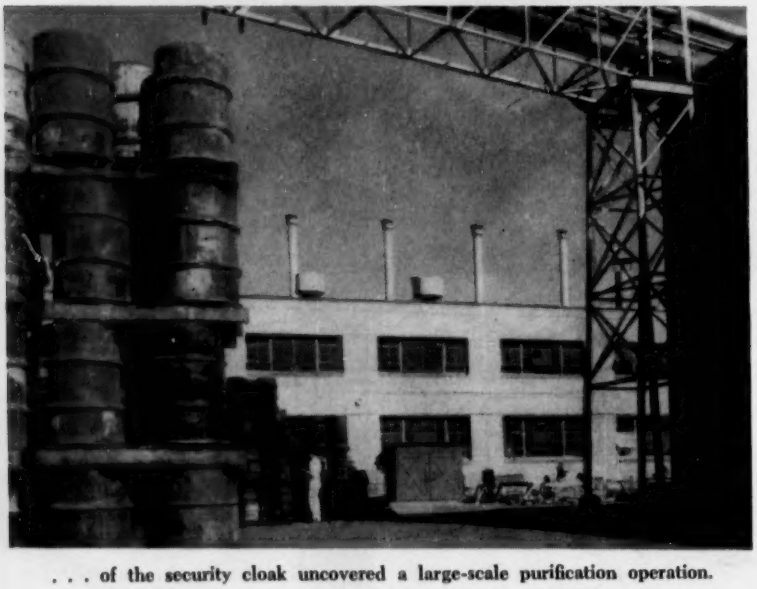


FEED MATERIALS PLANT: Some obvious conclusions, and a partial lifting . . .



. . . of the security cloak uncovered a large-scale purification operation.

Assignment to Unknown

The tale could have been told before. In fact, it has been told—at least in part—many times over in every college sophomore chemistry course, for essentially it is qualitative analysis on a grand scale. But for 12 years the details remained behind dark glasses; those involved shied away from publicity. And understandably so, for this, briefly, is the story behind the atom bomb—a processing story about very crude ores that were converted on a large scale into very pure uranium.

But it is more than this, for 1942 was a dramatic time characterized by undercurrents of anxiety and urgency: it is also a story about handling toxic radioactive materials that ought not to be handled without elaborate safety precautions—a process that, in spite of a great many unknowns, was probably the fastest scale-up on record. It is also the story of the highest degree of purification ever achieved on a commercial scale by the chemical industry—i.e., by Mallinckrodt Chemical Works (St. Louis), whose task this was.

Record Run: As soon as atomic energy seemed feasible and a government survey showed that sufficient impure uranium oxide concentrates would be available, there arose the need for a refiner. Data published by the French in 1842 and corroborated by the National Bureau of Standards showed that, on a small scale at least, ether extraction could be used to provide an extremely pure uranium dioxide.

Qualified through long experience in the production of highly purified chemicals and in the handling of ether, Mallinckrodt got the job of refining the crude uranium ore. In April, 1942 production was a beaker-size affair; by July, 1942, production had reached one ton of dioxide per day.

The scale-up continued as completion of Oak Ridge and Hanford Works brought increased demand. The dioxide was converted into uranium tetrafluoride, part of which was reduced to uranium metal and then cast as ingots. The ingots were machined elsewhere into slugs for use in plutonium-producing piles; the rest of the tetrafluoride was channeled to Oak Ridge for separation of U-235 from the other isotopes.

Flexible Core: Meanwhile, feeds for the purification plant continued to come from all over the world, varied widely in uranium content. And while certain economies in acid and other chemical costs were attained by blending various feeds, each batch still required fairly individual treatment.

Consequently, the plant had to be built around a highly flexible operation that works like this:

Ore from such far-apart places as Australia, Canada, the Belgian Congo and parts of the United States is sent to the purification works, where it is first crushed in standard ore-crushing equipment and then ground in a ball mill. To prevent workers from breathing the ground particles at this point, auxiliary equipment is used.

The ground ore is digested—and for the most part, dissolved—in a hot nitric-sulfuric acid mixture. The insoluble portion (including radium sulfate) is removed by a rotary filter and stored elsewhere by the AEC (part of it for later return to Belgium). Nickel, cobalt and minor amounts of other ore-contained elements are like-

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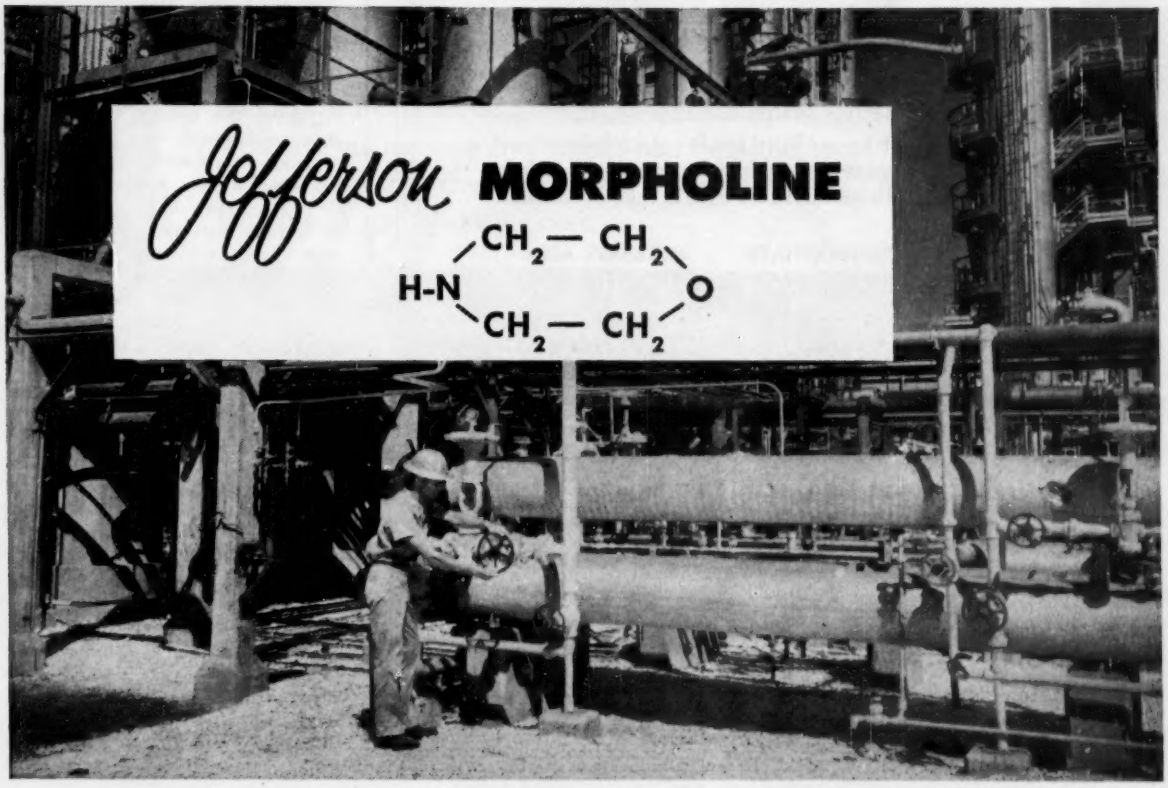

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Color, Pt-Co scale	15 max.
Boiling range, C.	
IBP	125.0 min.
DP	132.0 max.
Purity, wt. %	98.0 min.
Specific gravity, 20/20C.	0.999-1.004
Water miscibility	
10cc in 90cc water	No turbidity
Suspended matter	Substantially free

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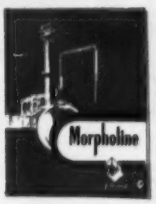

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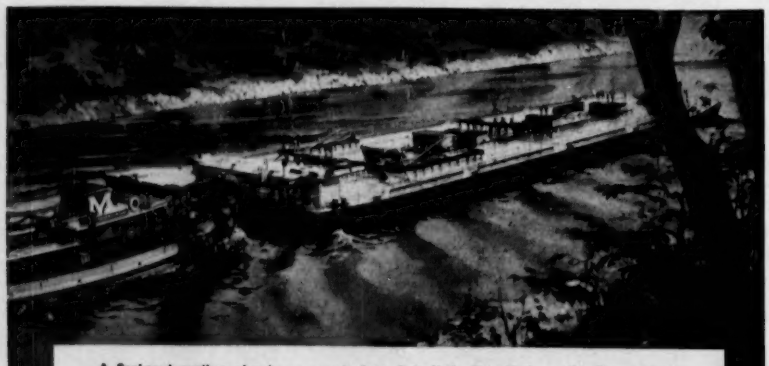

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wise stockpiled. After treatment with barium carbonate to precipitate sulfates, the filtrate is essentially uranyl nitrate.

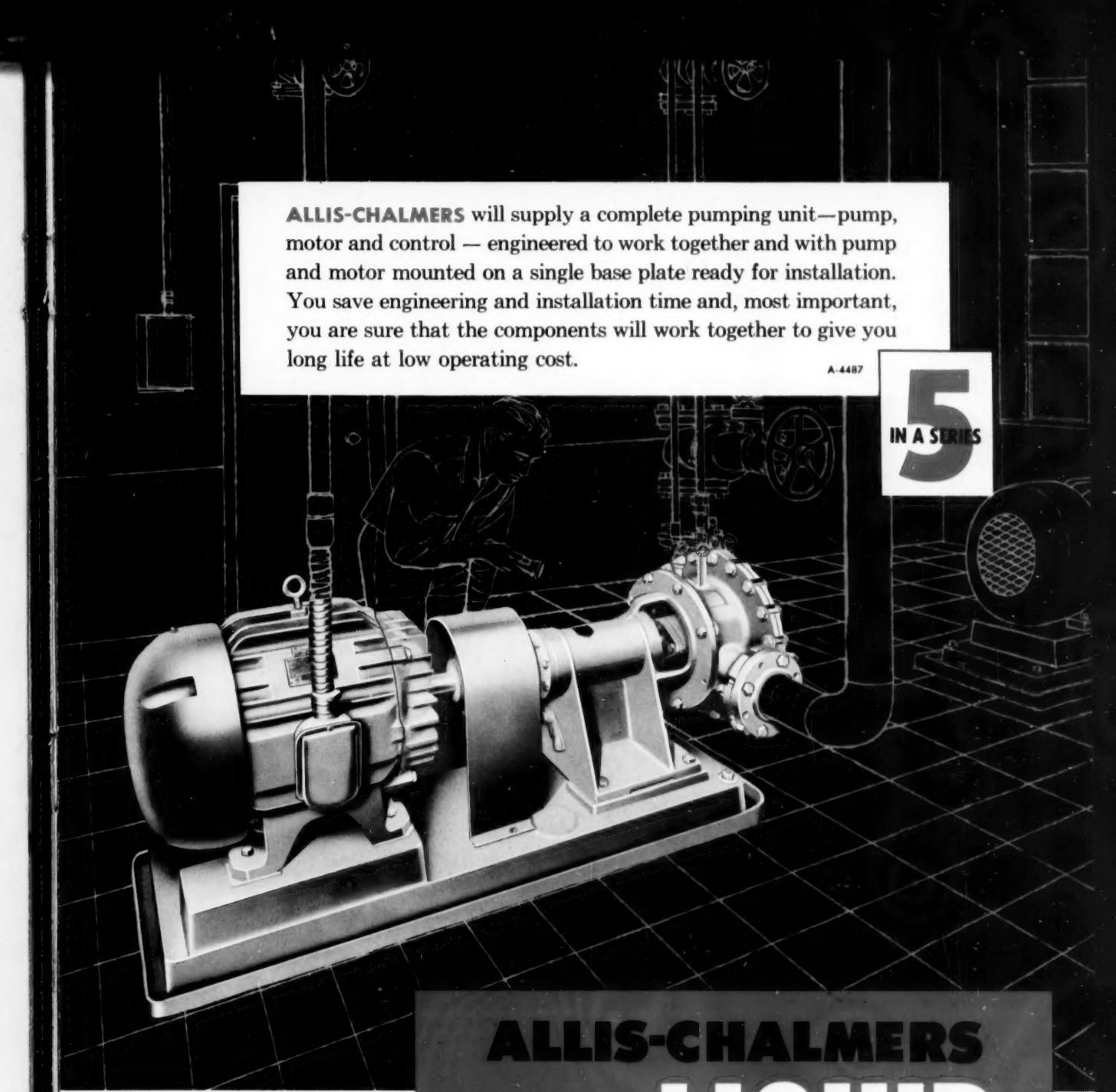
To obtain the high degree of purity required, the uranium compound is then continuously extracted from the aqueous filtrate with ether. Fortunately, uranyl nitrate dissolves more readily in ether than do the impurities and so can be separated from contaminants. From the ether solution, the highly purified uranyl nitrate is re-extracted with water since an aqueous solution is far easier to handle in subsequent steps than highly flammable ether.

The uranyl nitrate is converted into uranium trioxide by thermal denitration, then reduced to uranium dioxide by heating in hydrogen. The dioxide is treated with hydrofluoric acid, converted into uranium tetrafluoride. The tetrafluoride product stream then takes one of two directions: either it is reduced to uranium metal for metallurgical conversion into pile slugs, or it is converted into the hexafluoride for separation into its isotopes, U-235 and U-238.

Long Shadow: Some of the finer process details, of course, are still under security wraps, and shall probably remain so for some time. But the bold outline of the operation has been sketched in.

Admittedly, impure ore was being converted into suitable pile material, but the questions were: where, how, and by whom? The casual observer, perhaps, could find no bridge between the impurity of the ores and the extreme purity required in the final materials destined for pile or bomb use, but more discerning laymen and technical men knew that one must exist. It wasn't to be found, of course, among the folds of the project's ample security cloak; rather, it lay 100 years back of that, in a small ether extraction flask atop a work bench in a small French chemical laboratory. The French scientist, unaware of the full significance his discovery was to have on civilization, duly recorded it in a notebook—there it lay dormant for a century, only to make its reappearance in 1942.

Since then, no single subject in history probably has enjoyed the intense interest—and fear— of so many people from all walks of life; tidbits of information have been avidly snapped up as soon as they were declassified. But few clues to actual processing operations appeared until recently, when, in an advertisement under the esoteric head "Project 42-17" (which was merely an account-



ALLIS-CHALMERS will supply a complete pumping unit—pump, motor and control — engineered to work together and with pump and motor mounted on a single base plate ready for installation. You save engineering and installation time and, most important, you are sure that the components will work together to give you long life at low operating cost.

A-4487

5 IN A SERIES

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Equipment for LIQUID HANDLING

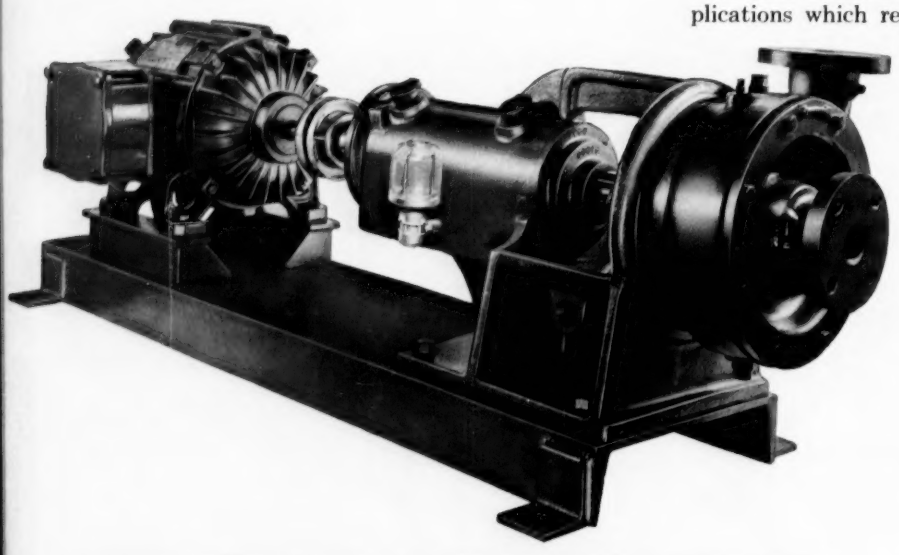
in the Chemical Industry

A-C ALLIS-CHALMERS

PROCESS PUMPS

Capacities to 10,000 gpm—Heads to 600 feet—Temperatures to 800 F

Allis-Chalmers offers a complete line of process pumps covering a wide range of applications in the chemical industry. Each pump is available in many different materials and with a choice of sealing methods to cover almost any requirement. Every installation is application engineered by men with an intimate knowledge of chemical industry problems.



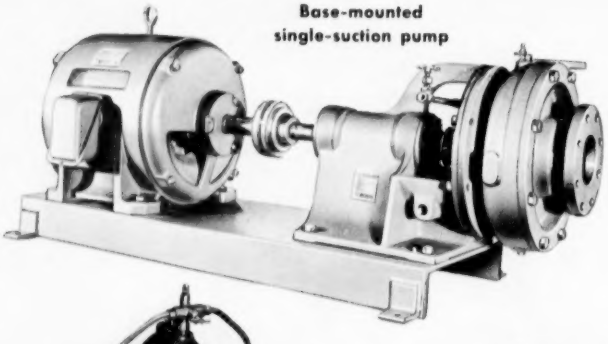
All-Purpose Process Pump

This Allis-Chalmers pump is designed for those applications which require heavy duty process pump construction but which do not require special features in handling abrasives or extreme temperatures. Oil-lubricated bearings permit operation up to 550 F. A wide variety of materials plus several stuffing box arrangements utilizing both standard packing and mechanical seals makes this pump ideal for pumping many liquors, corrosive solutions, hot liquids and petroleum products.

For capacities above 3500 gpm, the Type PW, a sister pump to the CW shown below, is recommended. This process pump is available in all the usual corrosion-resistant materials.

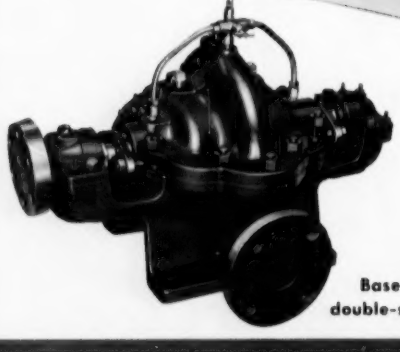
GENERAL PURPOSE PUMPS

Base-mounted single-suction pump

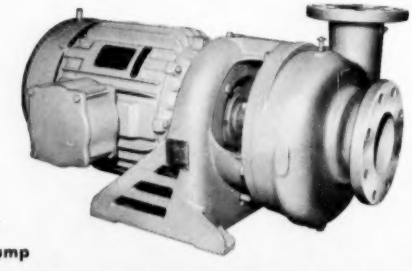


Capacities to 25,000 gpm
Heads to 550 feet
Temperatures to 250 F

Allis-Chalmers also offers a complete line of general purpose pumps for water supply, fire protection and many other services in chemical plants which do not require the special feature of process type pumps. Sizes range from fractional horsepower close-coupled units to large double-suction units to the largest practical size. Models are available in both close-coupled and base-mounted styles with a wide variety of material and seal options.



Base-mounted double-suction pump



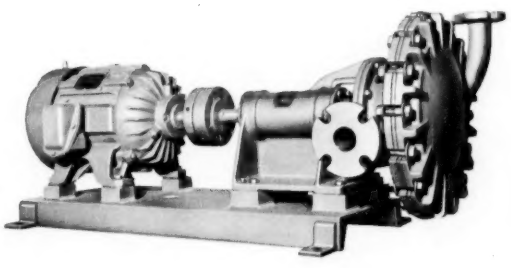
Close-coupled single-suction pump

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Corrosive-Abrasive Pump

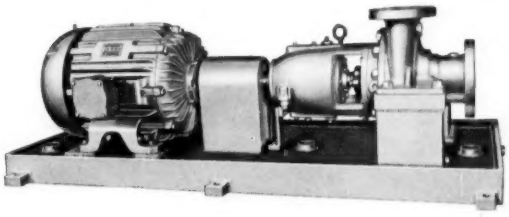
Allis-Chalmers Type P and PD Process Pumps are designed and built especially to handle corrosive and abrasive liquors—particularly liquors having a high concentration of finely divided suspended solids which cause excessive packing and sleeve wear in ordinary pumps.



Special *Equiseal* stuffing box eliminates leakage

Auxiliary impeller produces a low pressure area in front of the stuffing box. On suction heads up to 15 feet at 1750 rpm, the pressure on the packing is zero. None of the liquid being pumped touches the packing.

High Temperature Refinery-type Pump



The Allis-Chalmers Refinery Type R Pump is designed to handle products at temperatures up to 800 F and pressures to 600 feet. It offers special optional arrangements for cooling and sealing as well as wide range of materials to give you exactly the combination you need. NPSH requirements are low to facilitate handling of volatile liquids at temperatures near their flash points. Double volute casings in the larger sizes permit operation over the wide range of heads and capacities often found in process work without excessive wear or damage to pump.

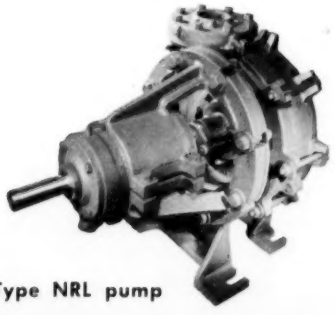
SOLIDS HANDLING PUMPS

Capacities to 10,000 gpm—Heads to 165 feet—Temperatures to 250F

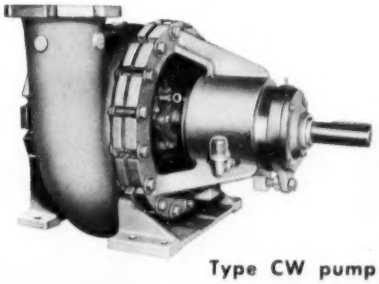
For handling most types of solids suspended in water, Allis-Chalmers builds a complete line of pumps. Type CW pumps are made of wear-resisting *Allisite* hard iron alloy and *Ni-Hard* nickel alloy. These pumps are recommended for larger particles such as gravel, coal, chemical pulps, dolomite, bauxite and similar materials.

For handling finer materials from − ⅛ in. to 325 mesh, such as slimes and slurries, tailings, sand, grinding mill discharge, silicon carbide, aluminum oxide and similar materials, the rubber-lined Type NRL pump is recommended.

Both pumps are designed with extra heavy working parts to stand up under difficult operating conditions. Assembly and disassembly are made easy by special construction. Inspection and repair may be made with a minimum loss of productive time.



Type NRL pump



Type CW pump

POWER PACKAGE for the Complete Pumping Unit

Motors

Allis-Chalmers builds standard and special motors for practically every purpose. Illustrated is the totally-enclosed, fan-cooled chemical motor. (Also available in explosion-proof.) Frame is corrosion-resistant cast iron. Rib-type design provides ample reserve cooling capacity. No inaccessible air passages. Improved bearing design affords maximum protection against foreign matter — facilitates in-service lubrication. Design shown is built in NEMA standard sizes. Larger motors are tube-type design, also especially adapted to chemical plant use.

Control

Allis-Chalmers offers an extensive line of manual and magnetic starters to meet every condition of motor operation. Functions available include full or reduced voltage starting, controlled acceleration, speed control, reversing or non-reversing and dynamic braking. All types of protection available depending on application. Choice of general purpose or special cabinet, including water-tight, dust-tight and explosion-proof enclosures.

Texrope V-Belt Drives

Most complete line of V-belt drive equipment in the industry. All sizes of belts in both standard and premium construction. Constant speed sheaves have Magic-Grip bushings, fastest mounting, surest gripping in the industry. Variable speed over a complete range is available with Vari-Pitch variable speed sheaves.

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COOPERATIVE ENGINEERING

Your A-C representative is an application specialist — ready and able to work with your staff or your consulting engineers to solve your processing problems. His recommendations are backed by Allis-Chalmers engineering departments . . . by complete research, testing and pilot plant facilities . . . by experience gained in solving thousands of equipment coordination problems. Each processing problem is given personal, expert attention. Engineers and technicians examine and evaluate your process to make *existing* as well as *new* equipment as productive and economical as possible.

UNBIASED RECOMMENDATIONS

Because A-C builds many types and sizes in a given equipment line, recommendations are completely unbiased . . . dictated only by your specific needs.

Most important is the fact that Allis-Chalmers interest in your problem is continuous. Laboratory services, periodic equipment check-up, emergency parts service are yours for the life of the equipment.

Allis-Chalmers builds the following types of integrated equipment:

HEAVY	1	Crushers • Grinding Mills • Screens
LIGHT	2	Flaking Mills • Roller Mills • Screens
PYRO-PROCESSING	3	Furnaces • Kilns • Coolers • Dryers
POWER	4	Generators • Condensers • Pumps • Transformers • Switchgear Substations • Motors • V-Belt Drives • Control
LIQUID HANDLING	5	A complete line of Centrifugal Pumps
AIR AND GAS HANDLING	6	Centrifugal Blowers • Axial Compressors

Allis-Chalmers also makes equipment for solvent extraction, electronic heating, metal detection, and inter-floor conveying.

A-4487

Allis-Chalmers
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Send me the following bulletins:

☐ 25C6177, "A-C Equipment for the Process Industries."

☐ I would also like bulletins on ..... (type of equipment)

(Explanation of process or problem)

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Name.....

Title..... Company.....

Address.....

City..... Zone..... State.....

WRITE FOR LITERATURE

A 28-page insert, "Allis-Chalmers Equipment for the Process Industries," may be found in the Chemical Engineering Catalog. This insert is available in bulletin form (25C6177). Individual bulletins covering specific equipment lines also are yours for the asking.

ing number for the project), Mallinckrodt gave a hint of what had gone on in the past.

Purity Plus: Shortly after Hiroshima and Nagasaki were leveled, however, it did become common knowledge that atomic bombs contained unique ingredients: one type used U-235, a highly refined isotope occurring in low concentration in native uranium ores; the other used plutonium, artificially produced from uranium.

To be effective, it was pointed out, these atomic materials had to be extremely pure. Certain impurities such as boron will absorb the split-off neutrons so readily that even one part in a million will seriously hamper the efficiency of an atomic pile. Tolerances for nearly all possible impurities fall below 100 ppm., require processing that surpasses even pharmaceutical levels of purity.

It was logical that Mallinckrodt, a long-time supplier of chemicals to the pharmaceutical industry, should be chosen to pioneer this project. Several others* participated in the uranium production program, but Mallinckrodt operated the principal purification and metal production plant under contract to the AEC. The plant is on Mallinckrodt land but is owned by the AEC, which to date has invested more than $17 million in capital costs there.

One of the other companies that later entered the program was National Lead Co. of Ohio (wholly owned subsidiary of National Lead), which started up a similar but larger plant as an AEC contractor in Fernald, O., in 1953.

In building the Fernald plant, National Lead and architect-engineer Catalytic Construction Co. duplicated on a larger scale some of the facilities developed by Mallinckrodt. The second plant cost $78 million—due partly to the increase in construction and labor costs in later years, partly to the fact that Fernald is equipped for blooming, rolling, and machining uranium metal, and has certain other auxiliary facilities as well.

Though capacity data are still classified, it can be said that both the Mallinckrodt and the National Lead plants have large outputs. And some idea of the size of the Mallinckrodt operation can be gained from figures in the company's recently released stock prospectus: 22% of its $36.2-million "sales" in 1953 were processing charges accrued under the AEC contract.

*Actually, the credit for wartime work on feed materials belongs to a team, made up of not only National Lead and Mallinckrodt but also others, like Harshaw Chemical and Battelle Memorial Institute.

That's just about all you have to pay, in effect, for the solvents you vaporize in your process. How? By recovering them for re-use with a COLUMBIA Activated Carbon solvent recovery plant.

Each year, COLUMBIA Activated Carbon solvent recovery plants save industry more than $150,000,000 by recovering over 2 *billion* pounds of solvent vapors. Efficiency of the plants is often better than 99%.

CARBIDE can design and supply a complete solvent recovery plant to fit your specific requirements—whether you vaporize 50 gallons or 100,000 gallons of solvent a day.

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PRODUCTION . . . .

EQUIPMENT

Half Scale: At a press preview of its new laboratory (Poughkeepsie, N.Y.) last week, International Business Machines Corp. demonstrated its new all-transistor calculator. Comparable in capacity to IBM's type 604 electronic calculator, the all-transistor model has a computing unit about one-half the size of the 604's unit, requires only 5% as much power.

•

Contract Let: For the design of its authorized experimental boiling water reactor, Argonne National Laboratory (Lemont, Ill.) has selected architect-engineer Sargent & Lundy (Chicago). Allis-Chalmers Manufacturing Co. (Milwaukee) will design, develop, construct and install power generation, heat transfer and special equipment for the power cycle.

•

Temperature Control: The Powers Regulator Co. (Skokie, Ill.) has come out with a nonbleed, pneumatic temperature control that can be used in the operation of diaphragm valves, damper motors, and similar control equipment. Dubbed the Limitem, it is a differential-expansion type of unit, has a temperature range from 35 F to 135 F.

•

Relief Valve: For low-capacity applications, Atlas Valve Co. (Newark, N.J.) has designed a high-pressure combination reducing and automatic relief valve. This type-F valve, says Atlas, can be used for initial pressures to 4000 psi., for reduced pressures from 2000 psi. down to 0 psi. It is a spring-loaded diaphragm valve that automatically opens to relieve excess pressure when reduced pressures exceed setting.

•

Piston Seal: A new "Class of 2" bead-type seal, developed primarily for power applications, has been marketed by Bellofram Corp. (Waltham, Mass.). It is a long-stroke, piston-seal diaphragm with a solid head, has the "O" ring bead characteristic, and says the firm, functions efficiently at pressures to 500 psi.

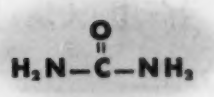
•

Southwest Service: Industrial Div., Sanborn Co. (Cambridge, Mass.), manufacturers of oscillographic recording systems, has appointed Neely Enterprises (Los Angeles) as its representative in California, Nevada, Arizona and New Mexico.

•

Texas Division: B-I-F Industries, Inc. (Providence, R.I.) has formed a Texas division with sales and service offices in Houston and Dallas.

For prompt delivery . . . specify



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Dependably pure and uniform chemical with these rigid specifications:

- pH (10% solution at 20°C.).....7.0 to 9.8
- Water.....0.50% Max.
- Ash.....35 p.p.m. Max.
- Iron..... 2 p.p.m. Max.
- Free Ammonia.....20 p.p.m. Max.
- Color, A.P.H.A. (10g. in 100 ml. methanol) .....10 Max.
- Turbidity, A.P.H.A. (50g. in 100 ml. water) .....20 p.p.m. Max.

How industry uses this versatile chemical:

The purity and uniformity of Du Pont Crystal Urea make it ideal for use in a large number of products and processes. Listed below are some of the many fields in which it is being used today.

ADHESIVES: Manufacture of urea-formaldehyde resin adhesives, including plywood and paper adhesives, binder for composition board made of wood waste, cold-set glues, laminating resins, and core binders . . . solubilizer in casein, animal and starch glues.

FINISHES: In enamels and other finishes in the form of modified urea-formaldehyde resins . . . in fire-resistant paints.

PAPER: In urea-formaldehyde resins for imparting wet strength to paper and paper coatings . . . softener for glassine paper and similar products . . . ingredient in fire-resistant compositions . . . solubilizer for starch in coatings.

PLASTICS: Manufacture of urea-formaldehyde resin molding compositions.

TEXTILES: In urea-formaldehyde resins to improve crush and crease resistance . . . in acid and direct dyes for screen and roller printing of textiles . . . with starch and other materials for sizing and finishing many types of textiles . . . in flameproofing compositions.

Du Pont Crystal Urea also finds many uses in such fields as cosmetics, detergents and pharmaceuticals.

Du Pont Crystal Urea is packaged in 100-lb. multi-ply paper bags. Prompt shipment can be made from strategically located stock points.

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Please send me full information on Du Pont Crystal Urea—including specifications, chemical and physical properties, suggested uses, bibliography, etc. I am particularly interested in using Crystal Urea for the following applications: _____

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*Name*_____ *Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

Antacids: digest of data

There've been big changes in antacids in the past few years—virtually a new business has been built around products to surpass "bicarb". Here's:

What's NEW

Commercially, the newest product is a proprietary tablet, Rol-aids, made by American Chicle. Another new one—Gastabs, by Thompson Medical.

In composition, about the newest ingredient is dihydroxy aluminum sodium carbonate, particularly suitable for tablets.

What's BIG

Top selling proprietary is Lewis & Howe's Tums, with 80% of the tablet "stomach sweetener" business.

Among ethical products (liquids), the fight's closer. Among the top sellers: Warner-Chilcott's Gelusil, Winthrop-Stearns' Creamalin, Wyeth's Amphojel.

What's USED

For proprietary tablets, calcium carbonate is major component. Also common: magnesium carbonate, magnesium trisilicate. Oil of peppermint.

For ethically sold tablets, aluminum hydroxide. Other components as in the proprietary tablets.

For bottled antacids, aluminum hydroxide gel, and magnesium hydroxide are most widely employed.

Contained in various antacids: ion exchange resins, vagus nerve blockers such as tetraethylammonium chloride, proteins, coating agents such as bismuth subnitrate and subcarbonate.

Behind the Beltline

There are new proprietary formulations, new antacid compounds adding zing to the competition in "stomach sweeteners."

Already a $40-million/year retail business, antacids are riding the crest of "medical respectability," should continue to climb in sales.

Now testing, in four widely scattered cities, is a brand-new over-the-counter antacid tablet—Rolaid, made by American Chicle Co. Its novelty: it is the first handy antacid made with the neutralizer, dihydroxy aluminum sodium carbonate.

There's reason for the quiet introduction of the tablets, away from "ulcer centers" like New York and Chicago. Rolaids could be the strongest challenge yet to fast-selling Tums, which have towered to a $12-million annual business since 1934. Rolaids are said to do their job of stomach sweetening well; further, they're merchandized by a market-wise, well-established company.

But right now, they're still test products, and American Chicle isn't eager to fritter away the head start it has with its new antacid. Digestion conscious or not, the populace of Columbus, O.; Rochester, N. Y.; Omaha and Moline-Davenport-Rock Island, can well serve as a good indicator as to how well a heavily promoted antacid mint will sell.

Bicarb's Successors: And even without the booming promotion that's possible for a giant like American Chicle, antacids have proved to be major drug items. The antacid mints alone boast a $15-million retail volume yearly. Magnesia tablets, antacid powders, gels, and liquids boost the volume to nearly $40 million annually, and that doesn't include alkalizing analgesics —Alka Seltzer ($22 million worth are said to sell yearly), Bromo Seltzer, and the like—which could probably double the figure. And, of course, it doesn't include the vast amounts of plain bicarbonate of soda (which has many other household uses).

Of the over-the-counter antacids, Tums, made by Lewis-Howe (St. Louis), is the undisputed leader. Introduced in the early '30's in the St. Louis area, Tums now take an easy 80% of the market for 10¢, roll-type stomach sweeteners in nearly every section of the country.

Sideline Antacids: But there's competition. A couple of the better-known dime-a-roll antacids are Jests (Jests, Inc., Brooklyn, part of Ex Lax, Inc.), which are sold nationally, and Alkaids (Hudson Products, Inc., Jersey City, a division of Block Drug, makers of Ammident toothpaste).

Probably equaling these in sales are Whitehall Pharmacal Co.'s Bi-So-Dol Mints (25¢ roll or box), which are available in two forms, one with chlorophyll. Amitone tablets (box of 50, 43¢), made by Norex Laboratories (part of Schenley Laboratories) is also a big seller, nationally. And Chooz, a chewing gum form, is a broadly distributed antacid produced by Pharmaco, Inc. (Kenilworth, N. J.), better known for its Feenamint gum laxative.

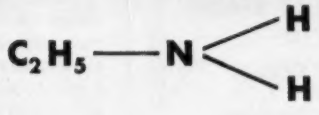
There are regionally sold products, too. About the newest is Thompson Medical Co.'s Gastabs, 30/$1, introduced in the New York area two months ago. The big drug chains have their own products, e.g., Rexall's Bismarex, and Walgreen's Bismadine.

Bottled Goods: With the introduc-

DOUBLE CHECKED ✓ FROM RESEARCH TO INDUSTRY

SHARPLES ETHYLAMINES

ETHYLAMINE

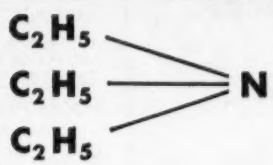


Its many uses include the production of amides, amine salts of sulfonates, salts of inorganic acids and the preparation of salts where improved solubility is desired.

DIETHYLAMINE

Among its varied uses are: the manufacture of emulsifiers, pharmaceuticals, amides, vulcanization accelerators, dyestuffs, surface-active agents.

TRIETHYLAMINE



Some uses: the isolation and purification of antibiotics; catalyst for phenolic resins; viscosity controller in enamels; acid accepting catalyst and solvent; intermediate for triethylammonium phosphate.

SHARPLES TRADE ✓ MARK CHEMICALS

Other Sharples Amines:

Propylamines
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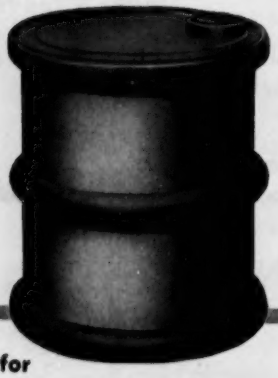

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tion of aluminum hydroxide gels, about 25 years ago, antacids assumed an important role in ulcer therapy that has improved in recent years. And in that quarter century, there has developed close competition for a market now valued at nearly $12 million yearly. Nearly all the major pharmaceutical houses make liquid antacids. Nationally, the leaders are Amphojel (Wyeth, Inc.), Creamalin (Winthrop-Stearns), and Gelusil (Warner-Chilcott).

These firms also put out tablet forms of their liquid products, and most report that in dollar volume, the tablets have equaled or surpassed the bottled forms, These products—both liquid and tablet—are "ethical," in that they are advertised only to physicians. They can, however, be purchased without prescription. Generally speaking, they are considerably more expensive than proprietary tablets.

Composition Variety: The large number of tradenamed products offered as stomach sweeteners is matched by the number of compounds that have been tried for their antacid ability. Not many new products, however, have been introduced with any real success in the past 20 years.

There are some exceptions. Rolaids, for example, are built around one such new product that seems headed for success—dihydroxy aluminum sodium carbonate (DASC).* It is the patent-applied-for compound of the Chattanooga Medicine Co. (Chattanooga, Tenn.), is in limited production only. Besides American Chicle, a number of other firms are said to be testing the antacid for possible use in their alkalizing mints. Included is Whitehall Pharmacal.

Dihydroxy aluminum aminoacetate (DAA) or aluminum glycinate, available since the late '40's, is another relative newcomer. Although it is sold in some ethical compounds [such as E. L. Patch Co.'s (Stoneham, Mass.) liquid and tablet Alzinox], it is best known as an ingredient in Bristol-Myers' aspirin compound, Bufferin. Sole U. S. manufacturer is Chattanooga Medicine Co.; it is also produced in Europe. U. S. production of this compound, which is strictly an antacid, is well over 100,000 lbs./year.

(Chattanooga Medicine Co.—as sole U. S. maker of both DAA and DASC—is in the unique position of being about the only firm selling patented antacids.)

Popular Gel: Firmly established now as a leading antacid is aluminum hydroxide, in both liquid and dried forms. Top drug houses like Wyeth and Winthrop-Stearns have "captive" production. Other leading producers are J. T. Baker, Reheis Co., Inc., and Mallinckrodt. Most estimates put antacid end use of the hydroxide at about 0.75 million lbs./year.

Also widely used in ethical antacid tablets is magnesium trisilicate. (Typical tablet formulation, Gelusil, contains 0.25 g. aluminum hydroxide, 0.5 g. magnesium trisilicate.) Production of this, most of which turns up in antacids, is estimated variously to be 0.5 to 1.2 million lbs./year. Big suppliers: J. T. Baker, Mallinckrodt, Merck. Some is imported, largely from England.

Other commonly employed ingredients are calcium, magnesium, and sodium carbonates (Upjohn's Alkets, for example, contain calcium carbonate, 12 gr., magnesium carbonate, 2 gr., magnesium oxide, 1 gr.), but firm figures on their use in antacids are difficult to find. Magnesium hydroxide, in the form of "milk of magnesia," is more often sold as a laxative than it is as an antacid.

One of the most common ingredients of alkalizing pills is oil of peppermint. Not only is its flavor a contributing factor, but also it has long had the reputation of being an aid to digestion in itself.

Anything Goes: In addition to the compounds mentioned, a large number of other materials have been probed as antacids. In some cases, the action is far from simple neutralization of excess acid. Among the approaches to acidity and ulcer therapy.

- Ion exchange resins. An example is Whittier Laboratories' (Chicago) Resmicon Tablets, which contain an anion exchange polyamine resin.
- Mineral coating agents. Bismuth subnitrate and subcarbonate are commonly used—typical product is Norwich's Pepto Bismol.
- Vagus nerve blockers. Designed to block the transmission of nerve impulses to the stomach, and thereby lessen hydrochloric acid secretion. G. D. Searle's Banthine Tablet (made with beta diethylaminoethyl-xanthene-9-carboxylate methobromide) is a case in point.
- Proteins. Milk is an example, but combinations of glycine and calcium carbonate (as in Schenley Laboratories' Titralac—and Norex's Amitone) are characteristic of the drug products.

Besides these, there are a number of other products, each with its firm proponents.

Burp Factor: Governing the choice

*Formed by reacting aluminum isopropylate with a basic solution of sodium bicarbonate. It is a white, fluffy solid, said to be almost tasteless.

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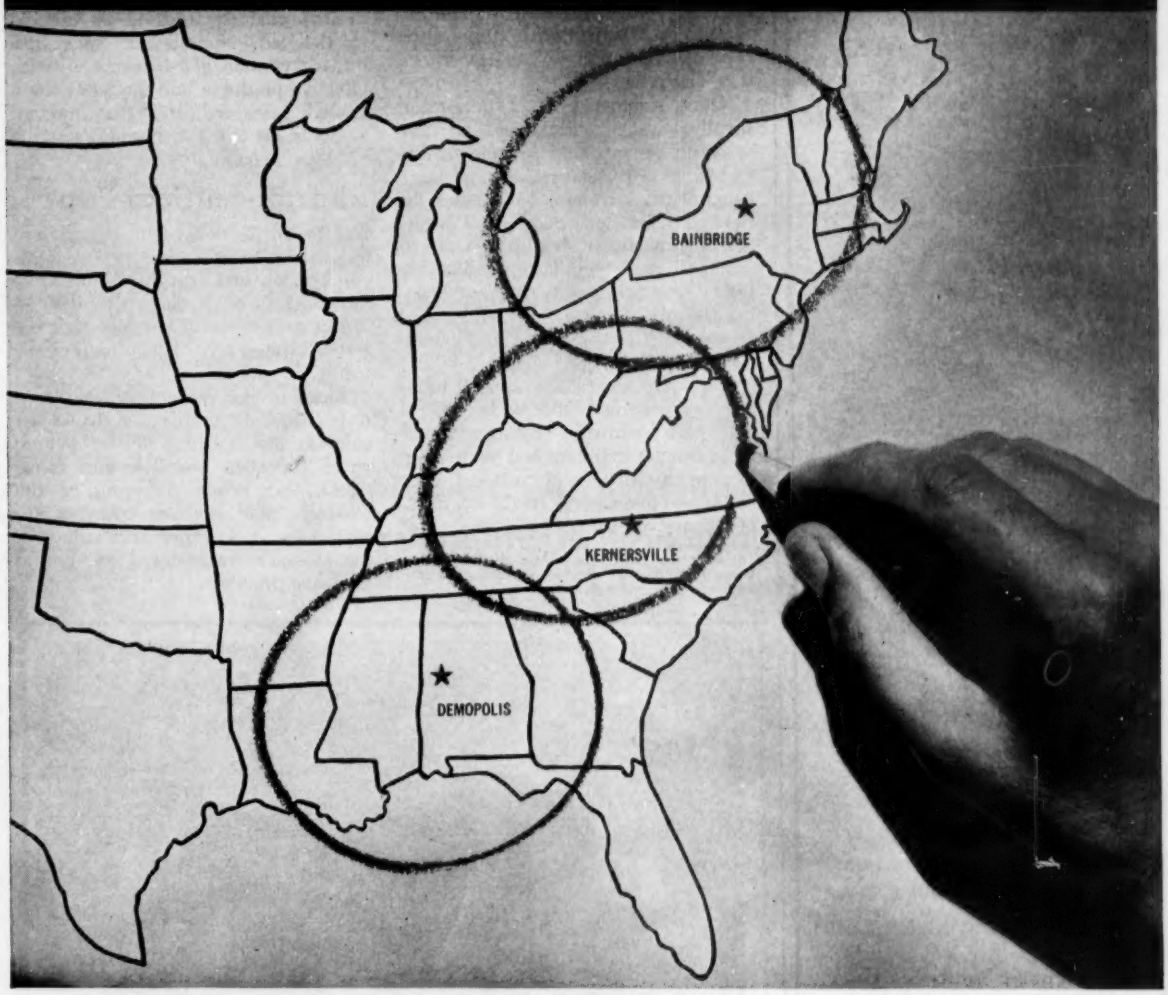

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of these acid neutralizers are a number of considerations. In making roll-type antacids, for example, it's almost mandatory to include a carbonate, so that the carbon dioxide formed by acid neutralization will cause eructation (burping).

Other factors are as important. Ideally, the antacid should be non-systemic (a systemic antacid is absorbed from the gastrointestinal tract, can disturb acid-base balance of the blood. Sodium bicarbonate and citrate are systemics). It should be fast-acting, and have long-lasting ability to buffer stomach acidity without hoisting the pH above 4.* It should have no tendency to constipate, and exhibit no toxic side effects.

Ability to meet these specifications has been behind the wide use of aluminum hydroxide (constipating effects can be counteracted with magnesium hydroxide or mineral oil), DAA, and magnesium trisilicate. Combinations of other compounds, of course, can result in preparations with the desired qualities.

There is difficulty in testing all the desired characteristics of an antacid in the lab. Nonetheless, specialties firms have managed to come up with effective products, and the $40-million annual sales indicates that modern antacids do a job that today's living tensions demand.

*Pushing the pH up to higher alkaline ranges causes secretion of excess hydrochloric acid—so-called acid rebound.

Pharmaceutical Pop

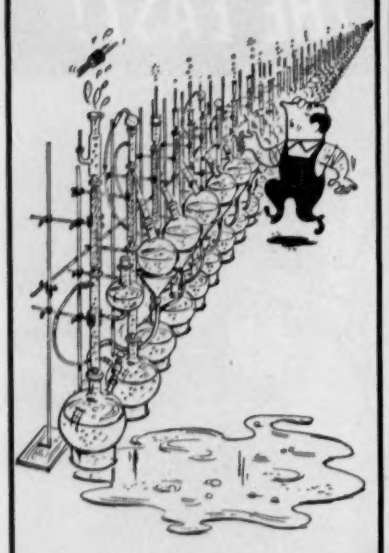
Not to be overlooked, in considering antacid specialties, is "pop." American Bottlers of Carbonated Beverages (an association) is currently advertising in medical trade journals that the bubbly beverages have therapeutic value.

Bases of the promotion are recent tests that show carbonated drinks accelerate the opening of the pyloric valve (between stomach and intestines), and hence emptying of the stomach. Acid stomach contents are passed on, and proper acid values in the stomach are restored by natural digestive processes.

Moving Against Mosquitoes

SAUDI ARABS start an antimalaria campaign with DDT-containing mobile sprayers in the Persian Gulf town of Qatif—a project jointly sponsored by the Saudi Arabian government and the Arabian-American Oil Co. The workers first attended a three-day course conducted under the auspices of Aramco's preventive medical department headquartered at Dhahran.

There they learned to mix the DDT solution, to operate the equipment (*shown*), to ferret out favorite breeding places of anophele mosquitoes. Result: effective fighters against an age-old scourge.



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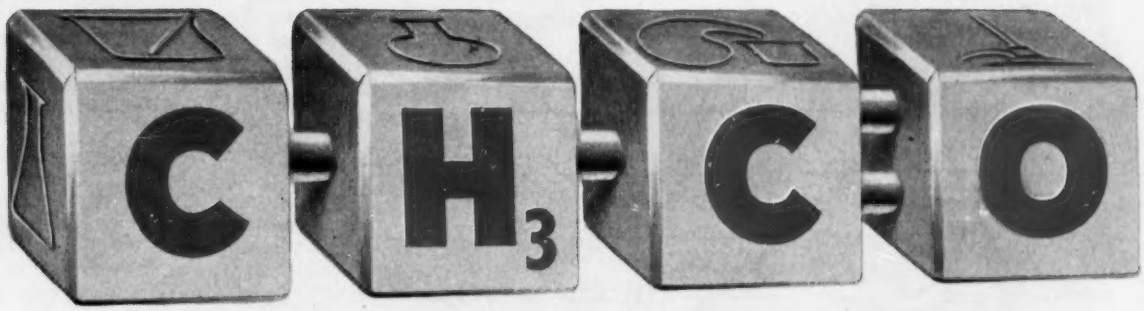

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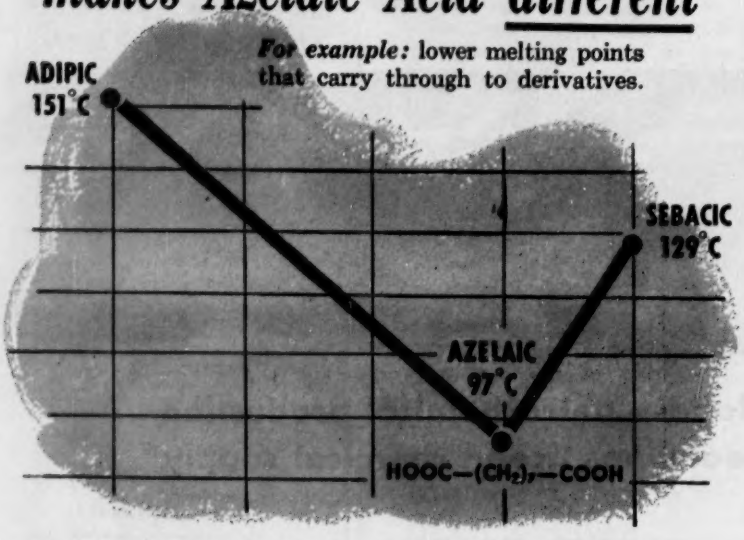

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	ADIPIC	AZELAIC	SEBACIC
Carbon Atoms	6	9	10
Molecular Weight	146	188	202
Melting Point, °C	151	97	129
Boiling Point, °C at 100 mm.	265	286	294
Water Sol. at 20°C, G/100 gm H_2O	1.44	0.24	0.10
M. P. of Amides, °C	220	175	210
M. P. of Anilides, °C	235	185	198
Freezing Point of 2, ethylhexyl esters, °F*	−15	−49	−8
Freezing Point of 3, methylbutyl esters, °F*	−90	−110	−67
Freezing Point of 2, ethylbutyl esters, °F*	−44	−53	+1

*Bried, E. M., *et al.*, *Ind. Eng. Chem.* **39**: 484 (1947)

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Coming Up

An even dozen papers are on the program for the 32nd annual meeting of the Federation of Paint and Varnish Production Clubs when it meets Nov. 18-20 at the Palmer House in Chicago. Some of the high points:

- Systematic study of low-odor alkyd paints. To help formulators to produce long-lasting finishes of this increasingly popular type, four alkyds have been given detailed tests—and specific recommendations on alkyd type will be given.
- Formulations of fire-retardant paints. The problem: intumescing coatings offer the most protection for flammable surfaces, but such coatings don't have much weatherability. Suggested solution: a fire-retardant, durable top coat to be applied over an intumescing primer.
- Mechanisms of paint film breakdown. Aim is to correlate the data from presently available commercial weathering machines with so-called "Florida exposures," so that standard exposure conditions can be set up. Work is primarily concerned with automobile finishes.
- Problems in pigment dispersion. Basic research on how toluidine red pigments are dispersed in various types of mixers and mills. The data was compared with that obtained in studies on titanium dioxide, covers such aspects as tinting strength, gloss stability of paints with various pigment-vehicle ratios, and produced by various grinding methods.

These technical papers have always been the feature attractions at the Production Club meetings, and the increasing complexity of modern finishes has made them even more important now than in years past. The Production Clubbers convene immediately following the meeting of the National Paint, Varnish and Lacquer Assn.

Chicks and Detergents

Chickens must be wondering what's next. Stanford Research Institute (Stanford, Calif.) recently conducted an experiment to determine the effect on weight gain of a commercial sodium alkyl aryl sulfonate detergent when added to the diet of a meat-producing breed of chickens. At levels of 0.5, 1.0, and 2.0 grams of active material per kilogram of diet, the detergent resulted in greater weight increases over a 12-week period than were made by fowl fed on an unsupplemented basal diet.

A reprint of a recent article on the experiment is available from the institute's public relations office.

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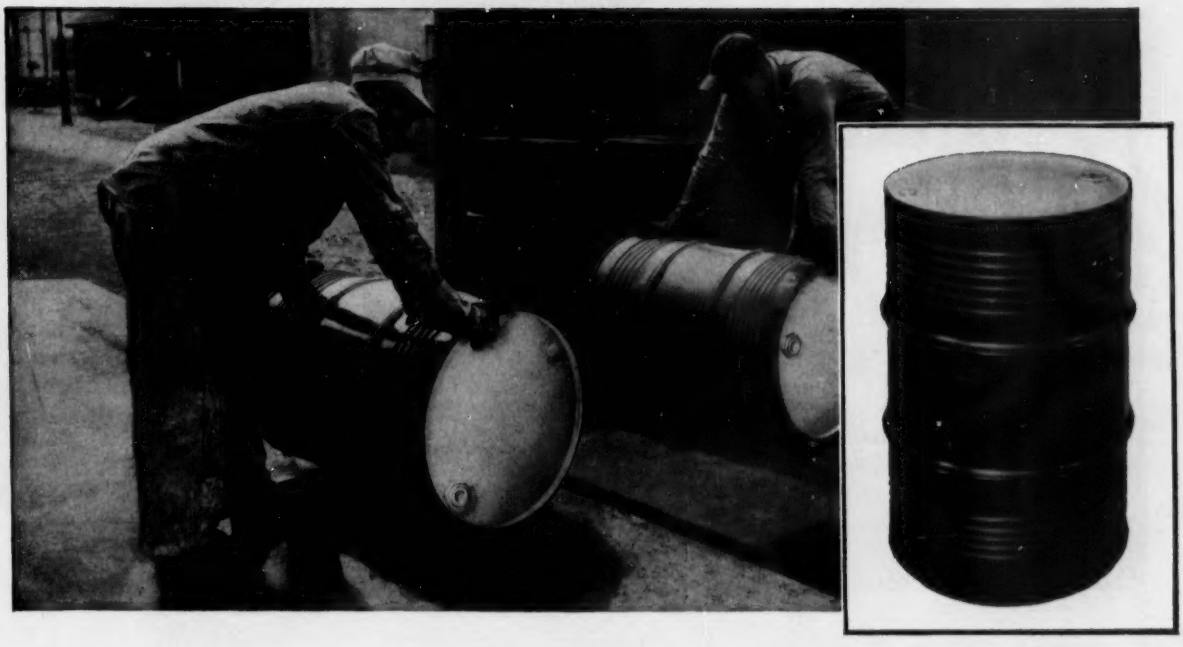

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FABRICATING a better future for aluminum aerosols.

Two for Aluminum

After one fumbled opportunity in 1950, it looks as if aluminum for aerosol containers is going to get a second chance. Pointing out the flexibility (in fabricating) of the lightweight metal, and emphasizing the ease of making eye-appealing packages, a pair of U.S. firms—Sun Tube Corp., Connecticut Chemical Research Corp.—have started beating the drum for aluminum.

Already in production at its Hillside, N.J., plant is Sun Tube. It claims to have licked the major drawback of aluminum tubes—a tendency to leak at the base seams—by using a different manufacturing technique: Sun impact-extrudes the tubes, instead of drawing them. Result: a container with thicker walls, which are strengthened by a special annealing process.

Bottom Fill: Sun's products differ from previously offered aluminum types in that they're filled from the bottom, rather than the top (*see cut*). The cans are supplied with an extruded housing designed for Precision valves; the loader puts in the desired formulation, and then seams on the bottom disc.

Top selling point of aluminum, as Sun sizes it, is its adaptability to attractive surface treatment, either by brushing or by high-polish finishing. Too, aesthetic appeal can be added by gold lacquer coating. It also emphasizes that its containers (2¼-oz., selling for 7½¢) are cheaper to ship than either tinplate or glass.

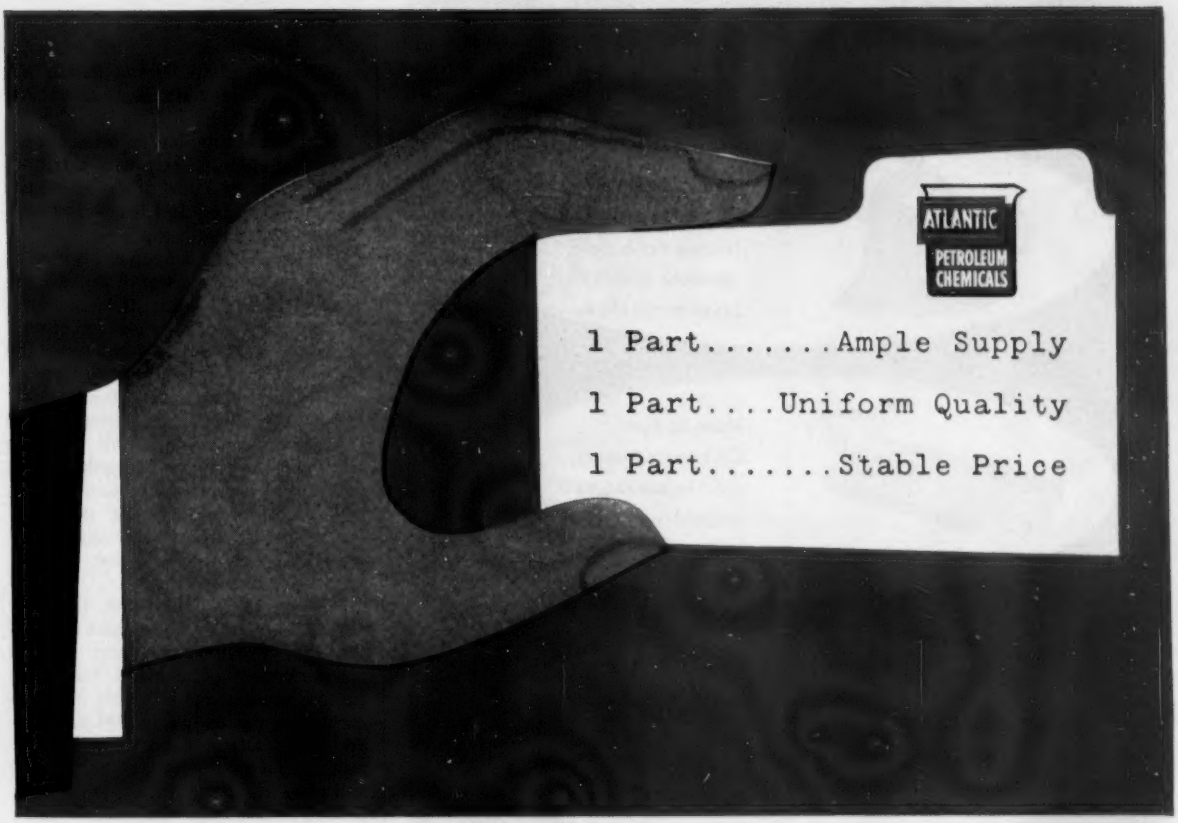
Currently showing off the pretty packaging that's possible with such tubes are such products as Quick-Dri, a nail polish drier sold by Revlon, and Minit-Dri, a similar type of product distributed by Mil-Hi Labs (New York). Another item is a spray deodorant, Obay, retailed by Pharmacraft (Batavia, Ill.).

British Know-How: "Something's cooking," is the way H. R. Shepherd, vice-president of Connecticut Chemical Research Corp. (Bridgeport, Conn.), cautiously phrases his firm's position. While he does not spell out what its next steps will be, he does say that its moves will be based on British rather than on U.S. know-how.*

This know-how belongs to Midland Aerosols, Ltd., which has been formed jointly by Connecticut Chemical, Midland Metal Spinning Co., Ltd., and London Aluminium Co. At present Midland is reported ready to go with three different types of containers:

- One is of extruded aluminum with the valve-seating surface solid and a base of "dished" tinplate. The can shoulder may be left polished, sprayed to match the body, or it may have annular grooves that can be deco-

*Aerosols aren't as popular in England as they are here. Total output there to date is placed at no more than one million.



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SPECIALTIES. . . . .

rated or left plain. The container will be made in four standard sizes: 20-, 12-, 6- and 4-oz.

• Another type has an orthodox extruded aluminum body with a bottom that's an integral part of the container. The top is domed and is covered with acetate plastic.

• A third type is open at both ends, and the bottom and top of tinplate are double-seamed onto the seamless aluminum body. (This method of construction is claimed to overcome the dangerpoint of leakage where the side seam meets the top and bottom seams.)

Price Tumble: As Shepherd sees it, aluminum containers will become more competitive with regular metal aerosols when aluminum companies in this country recognize the potentialities. "Once that happens—and it will happen—difference in price will be very small," he asserts.

There's every indication that the public will like the aluminum aerosols—if they prove satisfactory. There's no slackening of demand for push-button products—this year's requirements are put at nearly 200 million—and there seems to be room for aluminum and plastic as well as tinplate and glass.

•

Charcoal for Cigarets: Herbert Tareyton (American Tobacco Co.) is now using activated charcoal as a cigaret filter. It was developed by the Adsorbite Div. of the Barnebey-Cheny Co. (Columbus, O.), which produces the charcoal, and Ecusta Paper Co. (Pisgah Forest, N.C.), which makes and impregnates the cellulose paper that holds the charcoal. The cellulose is designed to absorb solid particles in the smoke, the charcoal the undesirable gases and vapors.

•

Now in Aluminum: Gates Engineering Co. (Wilmington, Del.) is offering its Gaco N-700 liquid neoprene maintenance coating in aluminum color. It's applicable by brush, roller, dip or spray.

•

Also Aluminum: Woodhill Chemical Co. (Cleveland) sells a new metallic aluminum putty that's brushed on cold, dries in hours, seals plumbing leaks, pots, pans. Price: $1.

•

Banana Protector: B. F. Goodrich Chemical Co. thinks it has hit on a way to prevent stem rot in bananas during shipment. Its answer: a fungicidal formulation that can be painted on the stems. Key ingredient: p.e.p.s. (polyethylene polysulfide).

•

Sulfur Sticker: Atlas Mineral Products

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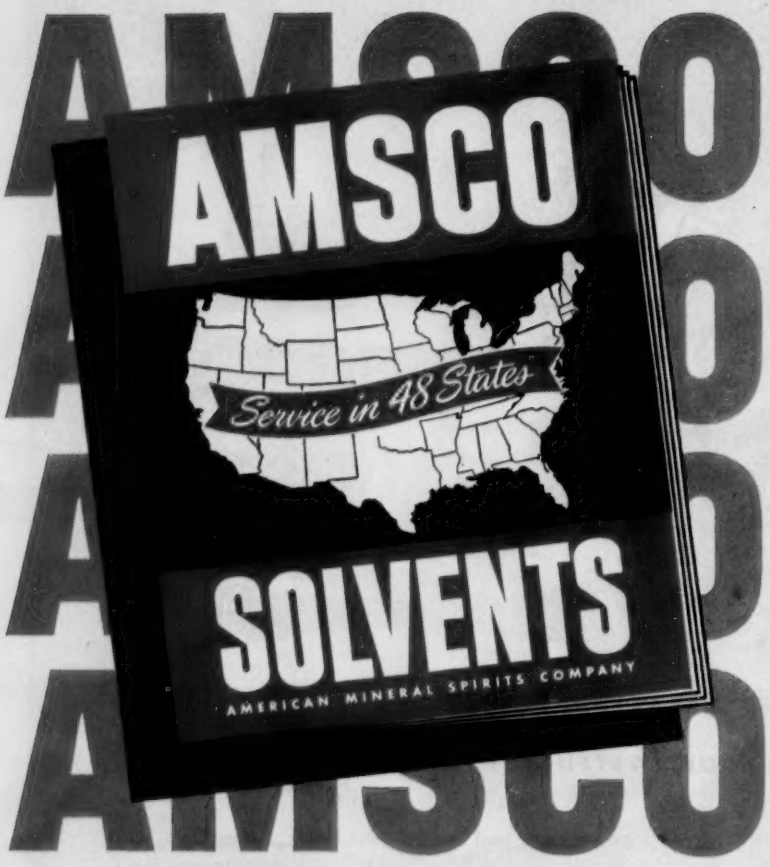

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Co. (Merztown, Pa.) now sells Vitrobond, a hot-poured plasticized sulfur cement suitable for joining corrosion-resistant brick and other ceramic structures.

•

Indiana Bound: U.S. Gypsum has chosen Indianapolis as test market area for the introduction of its new exterior paint, Texolite Texture. Officials say promotion will be the "biggest single-market paint campaign in the company's 30-year history in the paint industry."

•

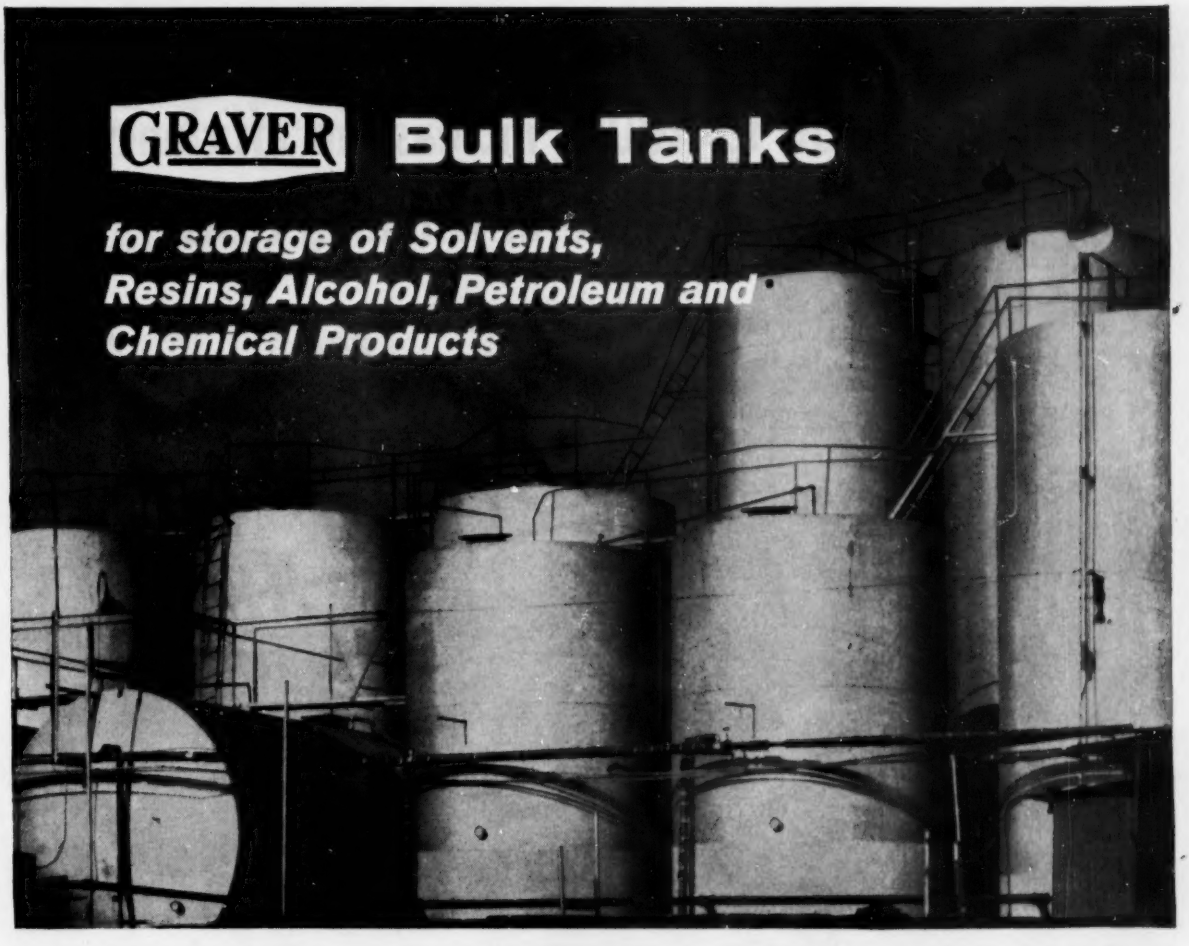
Reodorizer Re-established: Rhodia, Inc. (New York) reports it has re-established Alamask BD for the reodorization of neoprene latex. It was withdrawn from the market by Du Pont prior to the transfer of Du Pont's reodorant business to Rhodia.

•

Brown Pair: Columbian Carbon Co.'s Napico Color Div. (New York) has developed two new color pigments: Tan 15, an iron oxide pigment, is

Man Saver

EPOXY resins halve the personnel requirements for the job of putting in "gas plugs" in pressurized telephone cables. Developed by Thiokol Chemical Corp. to replace asphalt, the two-component resin formulation (amine curing agent, epoxy resin) can be readily mixed at use point, and injected in the cable to form a gas dam at any desired station. One man can easily do the job. Asphalt required special heating equipment, and the labor of two men.



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Double Time: Sapolin has started marketing a new fast-drying, odorless primer-sealer paint that can be second- coated in half an hour. It has a polyvinyl acetate resin base and can be used on woodwork, brick, plaster, cement, cinderblocks, wallpaper. It sells for $4.35/gal.

•

Bulletins: Some of the newest:

- Nopco Chemical Co. (Harrison, N.J.) has published an 8-p. booklet on its new series of Agrimul emulsifiers used in the formulation of liquid pesticides.
- The Chem Industrial Co. (Brooklyn, Ohio) has released a new 4-p. information bulletin on its Overust antirust paints.

•

Expansion: Chase Products Co. has opened its new 30,000-sq.-ft., $250,000 plant in Broadview, Ill. The present Maywood plant of the custom aerosol filler will be closed at a later date.

- Pope & Talbot is spending $250,000 to double production at its lumber preservative pressure-treating plant at St. Helens, Ore.

•

Super Tire Yarn: American Viscose Corp. (Front Royal, Va.) is now turning out a rayon tire yarn claimed to have high strength and improved fatigue characteristics. The new yarn —Super Rayflex—will ultimately replace the current type made by the company. It's priced at 64¢/lb.

•

Drug for the Millions: Parke, Davis & Co. reports it has a drug that's aimed at curing amebic dysentery, a disease that infects approximately 700 million people throughout the world. Not generally available yet, Camoform has performed well in clinical evaluation tests. An organic compound, it does not contain arsenic or other toxic heavy metals.

•

Just Out: Chemical Specialties Manufacturers Assn., Inc. has now released proceedings of the 40th midyear meeting held this past spring. Nonmembers may buy the 146-p. booklet for $7.50.

•

Wax For Industry: Maintenance Chemicals Mfg. Co. (Chicago) now offers Sheen, in industrial self-polishing, water resistant floor wax. Price: $3.95 gal.

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1 COLGATE ISOTOPE COMMITTEE† screens all suggested projects of new lab.

New Team on the Campus

One way to tap into the high-grade research brain-power and facilities of a major educational institution is to set up shop on the campus. That's the formula followed by Colgate-Palmolive Co. (Jersey City, N.J.) in establishing its new radioisotope laboratory (*CW, Oct. 2, p. 78*) at Rutgers University (New Brunswick, N.J.). This week, as the new lab's first research project—tracer studies on chemicals to prevent tooth decay—neared culmination, there was plenty of reason to believe the novel arrangement would be long-lived.

An apparently unique* industry-university venture, the lab is the result of careful planning and close teamwork between the dissimilar principals involved. Conceived by resourceful Thomas Vaughn, Colgate's vice-president for research and development, the plan installs Colgate equipment and personnel in the Rutgers-owned laboratory, establishes on-the-spot liaison with faculty experts in biochemistry, mycology, physiology and other fields of science.

A combination of circumstances favors this scheme. Colgate's studies utilize radioisotope tracers to explore the physiological effects of newly developed compounds that are candidates for inclusion in new products. This ties in nicely with similar biochemical research in progress at Rutgers' Bureau of Biological Research. And completion of the school's new chemistry building has made available the older laboratory the company is using.

Moreover, as the state university of New Jersey, Rutgers is highly interested in furthering the development of the state's industries. (Colgate has been a resident of Jersey City since 1847.)

Principal function of the new isotope lab is research aimed at providing a better understanding of how toiletry chemicals behave. The amount of germicide or deodorant clinging to the skin after application of a soap or personal hygiene aid is one example of a job cut out for radioactive tracers. Other likely probes: efficiency of detergents; degree of uniformity attained in mixing; loss of volatile materials (e.g., perfumes) in soap processing.

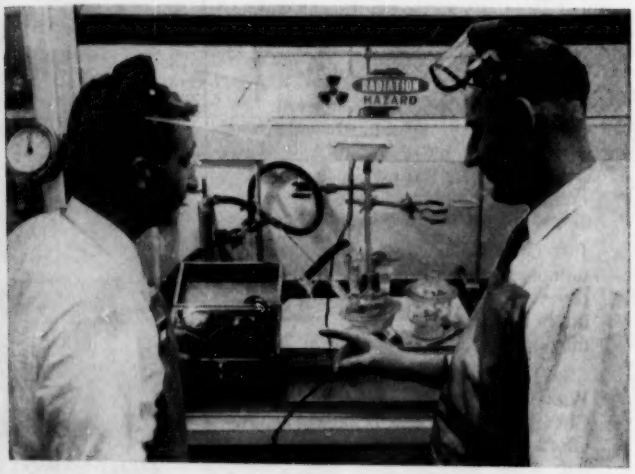
Right now three researchers man the new lab under the direction of Colgate's Manno Nelson. Experimental animals, a not inconsequential item, are supplied by the school's bureau of biological research.

While the new laboratory is in-

† Left to right: asst. research dir. William Egan; isotope lab head Manno Nelson (chairman); assoc. research dir. S. F. Conceybear; asst. research dir. Arthur Gebhart; physical chemist M. B. Epstein; instrument group leader Walter Thompson. Absent: Edward Lawrence.

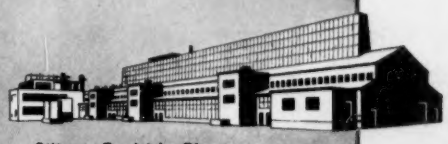
* A CW check of the Atomic Energy Commission and a bevy of tracer users failed to uncover a comparable arrangement between a school and a company in the chemical process industries.

2 LAB CHIEF Nelson and chemist decide details, then...

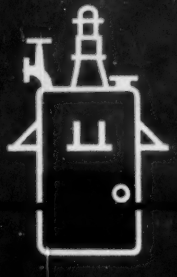


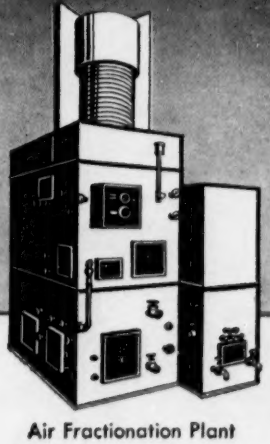
3 SYNTHESIZE needed tracer compounds with AEC isotopes.

5000° F



Silicon Carbide Plant





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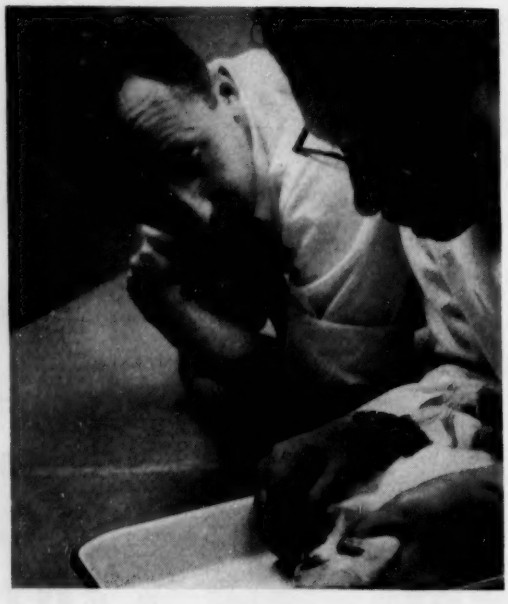


4 RAT'S TEETH are briskly brushed with tagged chemical in this study of possible new anticaries agent.

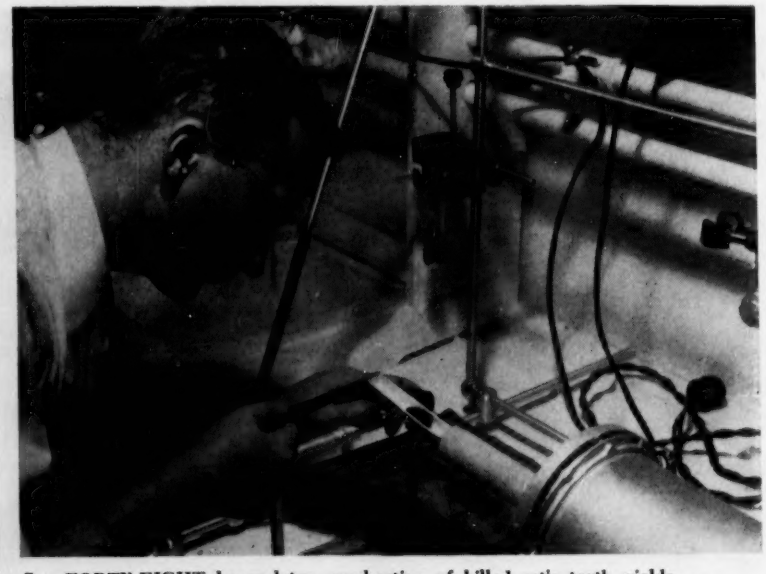
tended for use with low-level radiation, it can readily be adapted to high-level work hinging on the use of more powerful tracer elements. One feature: strippable paint throughout (walls, ceiling, lab benches, sinks), which can be removed if contaminated by radiation.

Strictly a safeguarding measure, 65 gal. of a special vinyl coating were required for one medium-size room. Replaceable tiles afford floor protection. There is provision, too, for expansion of present facilities should this prove necessary.

To date, Colgate can point to at least one significant finding by its new team of tagged-atom researchers. Gardol (sodium N-lauroyl sarcosinate), the company's much vaunted antidecay ingredient for toothpaste, has been found to cling to rats' teeth for a period of 48 hours.

Results of this kind, explains Nelson, are highly useful for confirmatory purposes; but, he points out, there is still no substitute for exhaustive clinical testing to determine the actual caries-combatting efficacy of any compound.

According to Nelson who, together with Rutgers chemistry chief Peter van der Meulen, worked out the details of



5 FORTY-EIGHT hours later, combustion of killed rat's teeth yields . . .

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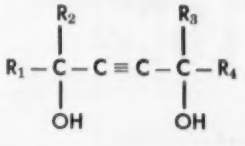

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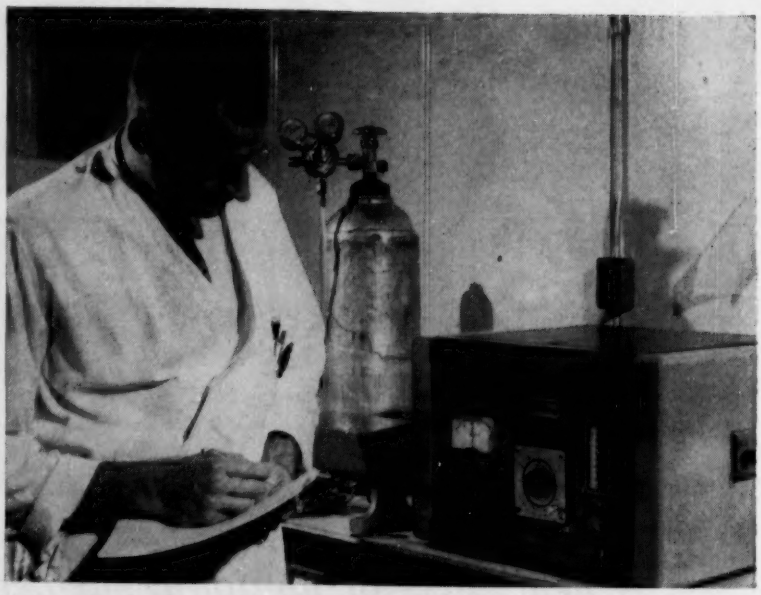

6 . . . TAGGED gases, which are counted, tell how much chemical clings to teeth.

Story begins on p. 76

the new lab, the system is proving ideal for the training of Colgate personnel in radioisotope work. An invaluable feature, this wouldn't be possible if the work were farmed out to commercial or nonprofit research organizations.

Van der Meulen, in whose academic bailiwick the laboratory is located, has had no reason to regret his endorsement of the move, feels a pattern has been set that is deserving of a close look by other industries and institutions of higher learning. He warns, however, that the availability of suitable space for such an arrangement is likely to be the chief stumbling block at most colleges and universities.

Part of van der Meulen's satisfaction doubtless stems from the benefits accruing to his department.

In addition to the provisions for the isotope laboratory, Colgate recently instituted three new graduate fellowships in chemistry, each of which allows $2000/year for two years of graduate study and research. One of these is in the area of aromatics and essential oils.

Another Colgate grant for $5000 has been made to the university's bu-

7 RUTGERS biologist Allison (l.) evaluates data, lends added depth to staff.

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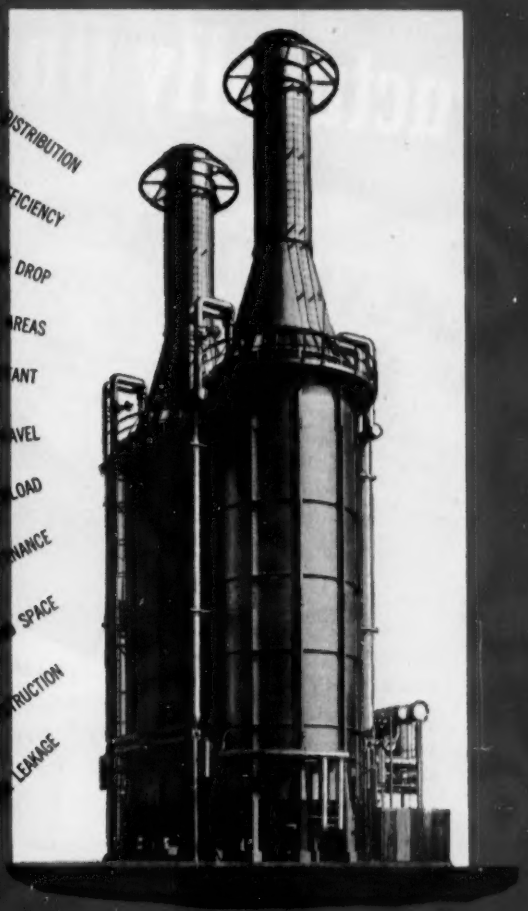

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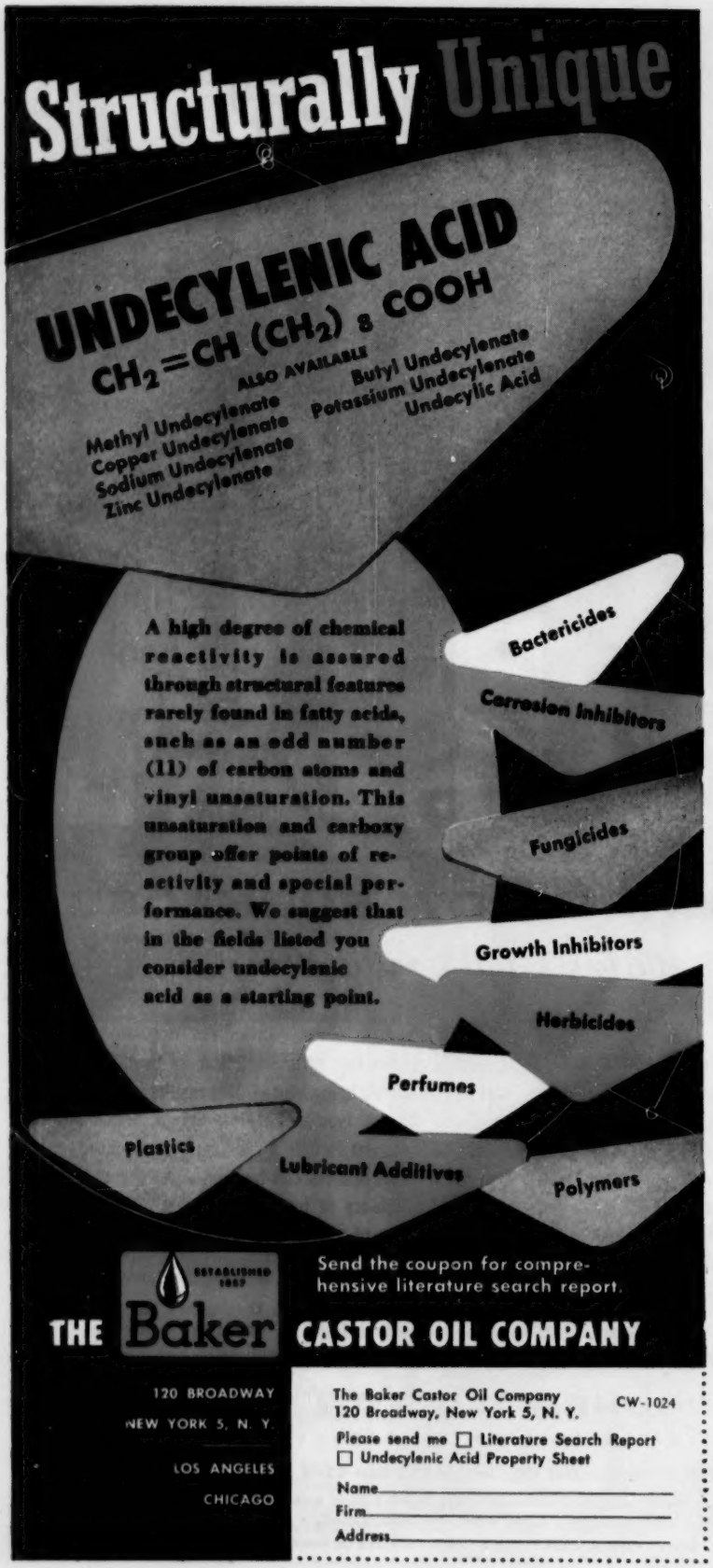


RESEARCH . . . . . .

reau of biological research for isotope studies with therapeutic agents.

Other branches of the university also stand to gain from the arrangement with the company. Researchers at the school's agricultural experiment station, for example, welcome the know-how brought by Colgate scientists.

Joint Benefit: Even before the company's appearance on campus, isotope labs were maintained at the school's farm and biology bureau. In endorsing the move, Rutgers scientists opine that in the fast-evolving tracer field all basic finding—even in apparently unrelated areas—are bound to prove mutually important.

In a broader way, the cooperative scheme ties in with the university's just-revealed plans for establishing a radioisotope center. Blueprinted jointly by Rutgers and industry people, the new unit will provide, according to the school, "instruction and information on the use . . . of radioactive substances as a research tool."

Ten firms* have already signed up for membership in the new center, at $1000/subscription. An additional 20 participants will be required to render the program self-sustaining. Regardless of whether this quota is met, a basic course for members is slated for February.

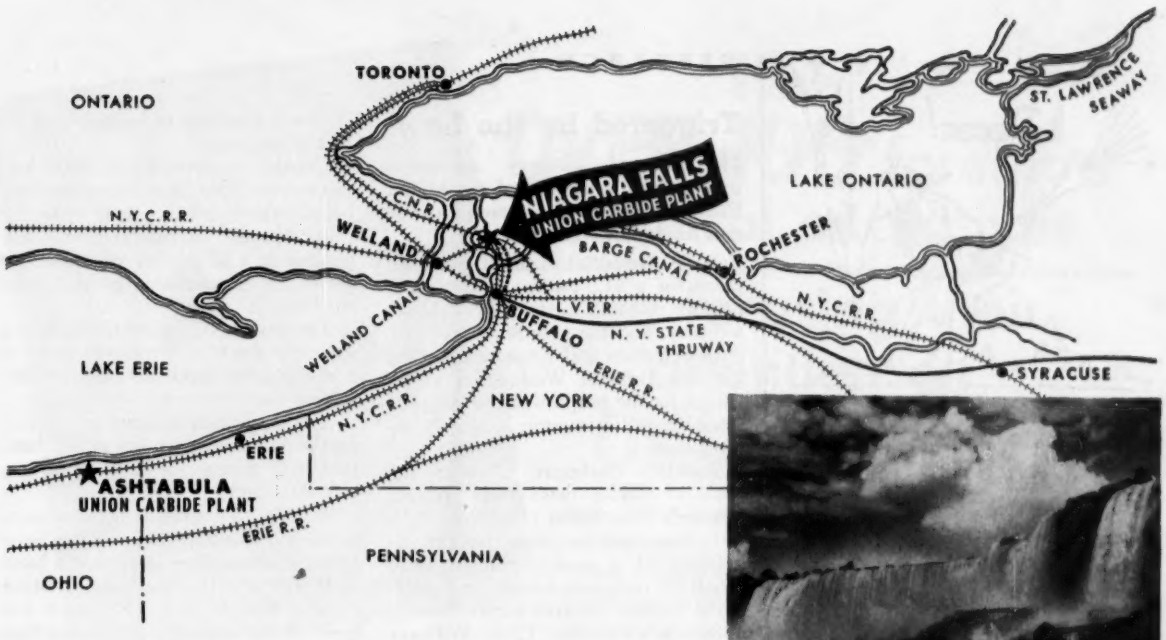
Despite the enthusiasm it has generated at company and college, the new laboratory is certain to draw a frown from those who worry about the dangers of such an arrangement to the function of universities as citadels of fundamental research. With some justification, they are alarmed at the increase of industry and government-sponsored applied projects at academic institutions.

This stand would seem to be borne out by Rutgers' own estimate—voiced by William Cole, director of the Rutgers research council—that sponsored research at the university has increased tenfold during the past decade.

A Balance: But he also points out that not all of this boost is in applied research; and it's well balanced by 80 basic research studies supported by the university's own funds. In all, more than $2,795,000 was spent on research at the school for the year ending last July 1.

Admittedly this is a problem; and it won't be solved over night. In the meantime both Colgate and Rutgers expect a good deal of basic knowledge to accompany the more practical fruits of their research alliance.

* American Cyanamid, Union Carbide, Johnson & Johnson, General Foods, Johns-Manville, Hoffmann-LaRoche, Campbell Soup, Hercules Powder, Socony Vacuum Laboratories and RCA Laboratories.



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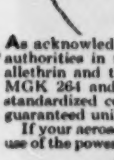

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Triggered by the Law

The atoms-for-industry movement touched off by passage of the Atomic Energy Act of 1954 gathered force on two fronts last week:

Battelle Memorial Institute unveiled plans for a $1.5-million expansion of nuclear research facilities available to industry; and the new Society of Nuclear Scientists and Engineers met for the first time in Washington to organize for the purpose of fostering the interchange of nuclear research information.

Battelle's disclosure, close on the heels of similar news from Armour Research Foundation (*CW, Oct. 9, p. 68*), blueprints proposals for the acquisition of a nuclear reactor, large cobalt-60 radiation source, and additional nuclear research laboratories.

Battelle's President Clyde Williams says that all funds for the expansion program have already been appropriated by the institute's board of trustees and that the new facilities are aimed at serving private companies. Since nuclear research means high investment in equipment and personnel, Battelle should have no dearth of industrial customers, no real difficulty in recouping its outlay.

As a matter of fact, the institute has already negotiated contracts with several private companies for research in nuclear power and nucleonics, has a comfortable cushion of work for the Atomic Energy Commission and other governmental bodies. A major target, according to Williams, is to make atomic energy competitive with coal in generating electric power. Urgency of this work stems from the fact that the nation's power needs are doubling every 10 years.

But it's expected that a whole array of other subjects will also come in for close scrutiny. Some examples: activation of chemical reactions; irradiation of rubber and plastics; sterilization of drugs, foods and medical supplies; and study of the effects of radiation on electronic components, ceramic materials, and lubricants. In addition, biological and agricultural problems are likely to be investigated.

Of its total planned expenditure, Battelle has earmarked $1,250,000 for a technical center near West Jefferson, O., another $335,000 for new atomic laboratory equipment at its Columbus headquarters.

The West Jefferson site occupies 397 acres, will include buildings for the reactor and an associated laboratory, a fuels lab, and a development lab devoted to nuclear power plants. Construction work on these three facilities is expected to begin about the first of the year.

Capable of operating at 1000 kw., the reactor Battelle contemplates will be of the swimming-pool type (so called because the reactor core is submerged in a large tank of water that serves as moderator, coolant, and shield).

The device will function chiefly as a source of neutrons for experiments on power-reactor cores, and the production of radioisotopes.

A building now nearing completion on the Columbus grounds of the institute will house the 2000-curie cobalt-60 source.

Battelle, of course, is no newcomer to nuclear research circles. It has been probing atoms since 1941, lent a hand in World War II's Manhattan District Project. For the past 12 years it has been doing research on nuclear-fuel elements and materials for the AEC, supplemented by related research for AEC contractors and other governmental agencies. The institute also played a part in studies leading to construction of the *Nautilus*, the first atomic-powered submarine.

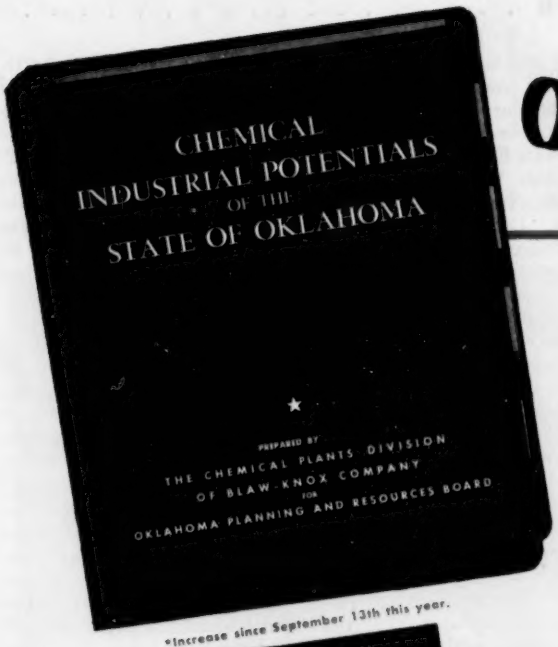
New Support: Released, by act of Congress, from a skein of atomic restrictions, Battelle is currently out to balance these predominantly military assignments with a liberal measure of industrial work. It, and many other private organizations speculatively eyeing the liberated atomic energy field, will receive more than moral support in this aim from the newly formed American Nuclear Society.

Spawned by the new Atomic Energy Act, which for the first time rendered such groups feasible, the infant organization was set up for the avowed purpose of fostering "the integration and advancement of nuclear science and technology through the interchange of information . . . in all fields of research utilizing nuclear techniques."

This is directly in line with a major provision of the new law, which directs that unclassified technical information be disseminated to science and industry.

About 230 scientists and engineers comprise the charter membership of the nuclear group. Industry is well represented. The organizing committee, for example, carries the names of 20 industry men on a roster of 29. All told, about 13,000 individuals engaged full-time in industrial, governmental and educational aspects of atomic science are potential members.

Companies, as such, cannot join. But a number of firms actively interested in atomic research and devel-



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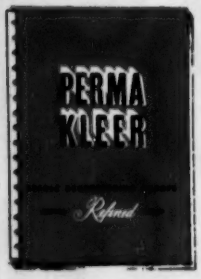

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opment are behind efforts to get the new organization off and running. Prominent among these are Monsanto, Union Carbide, General Electric, Bechtel Corp., Sylvania Electric Products, Babcock & Wilcox, Walter Kidde Nuclear Laboratories, Nuclear Development Associates, Commonwealth Edison Co. of Chicago, and Pacific Gas and Electric.

The first technical conference of the society is scheduled for June of next year on the campus of Pennsylvania State University where a new reactor is now taking shape. But the nuclear scientists aren't foregoing all public activity until spring. No sooner had the curtain rung down on last week's organization meeting than the ambitious group offered to aid AEC Chairman Lewis Strauss in implementing the international nuclear energy conference proposed by the President.

•

Citrus Product: From Sunkist Growers (Ontario, Calif.) comes word of a newly developed citrus derivative said to be useful in decreasing side reactions of toxic drugs. The product, obtained from orange and lemon pectin, is polygalacturonic acid. Combined with drugs (e.g., penicillin), which alone may be intolerable in massive doses, the new acid is said to reduce unpleasant side effects without altering desired healing properties. According to company officials, the product is inexpensive.

•

Wanted: These are among new additions to the list of compounds sought by the National Registry of Rare Chemicals: 1,2,3-butanetriol; *p*-ethylacetophenone; dilaurylselenide; oxalosuccinic acid; zinc hydride; dihexyl carbonate; 2,4-dichlorobenzyl alcohol; potassium thioplatinate; 2,3,5,6-tetramethylbenzoic acid; dihydrophorone; diethylgermanium iodide; and 3,3,3-trichloropropylene. Potential suppliers may contact the registry at Illinois Institute of Technology (Chicago).

•

Light Phenol: Carbide and Carbon Chemicals Co. (New York) now produces a new, light-colored version of its *meta*-Phenols 220, as the result of an improved refining process. Key to its low initial color is said to be the removal of practically all nitrogen bases. These contaminants are important to resin manufacturers because such catalytic bases can cause unwanted polymerization effects.

•

Fluorine Flurry: Two new U.S. patents bear witness to a flurry of research on fully fluorinated organics. Minnesota Mining & Manufacturing Co. (St. Paul) has been assigned Pat. 2,691,-043 on 1,1-dihydroperfluoroalkylamines and their acid salts, while Phillips Petroleum Co. (Bartlesville, Okla.) holds the rights (Pat. 2,691,052) to a new method of purifying perfluoro compounds. Briefly, the method depends on treating the fluorinated material with di-n-propylamine which reacts with impurities. These reaction products are then removed.

•

Sweet and Hot: Three newly listed isotope-labeled sugars are available from Schwarz Laboratories, Inc. (Mount Vernon, N.Y.). They include the carbon-14 versions of glucose, mannose, and yeast polysaccharides.

•

Academic Lift: Newly signed is a contract between the University of Maine (Orono, Me.) and the National Council for Stream Improvement (of the Pulp, Paper and Paperboard Industries) under which the university will conduct research on waste treatment methods applicable to Main's pulp and paper industry. Major goal of the research will be methods of treating waste sulfite liquor to minimize river pollution. So far, there is no economical method of attaining this end, according to university spokesmen.

•

Hide Toughener: Recently concluded U.S. Dept. of Agriculture tests showed that ordinary vegetable-tanned leather shoe insoles last about 70% longer when retanned with basic aluminum acetate.

•

Western Move: Starting this month, Stanford Research Institute (Palo Alto, Calif.) will maintain a project office in Honolulu, Hawaii. Heading up the Honolulu staff will be William Hosken, economist and manager of company development research. A chemist, secretary, and research assistant fill out the new group. First assignment: assembling information about the region, to be incorporated in SRI's Western Resources Handbook.

•

Nocturnal Study: Stanford Research Institute will shortly launch a night-air research study in connection with California smog studies, according to a recently signed one-year $126,000 contract with Southern California Air Pollution Foundation. The work stems from a theory that sunshine is an activator in chemical reactions that produce smog. SRI's Fred Littman and SCAPF's Lewis Rogers will expose samples of night air to artificial sunshine in probing the nature of smog production.

•

Stretch-Out: As part of its expansion

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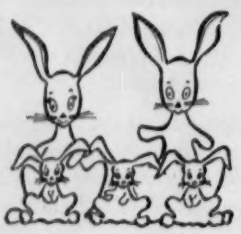

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RESEARCH . . . . . .

program, Shell Development Co. has just purchased 4.3 acres and three buildings adjacent to its Emeryville, Calif., research center. Former owners are the Western Electric and the Pacific Telephone and Telegraph companies. Conversion of the buildings to laboratories and offices is scheduled to begin soon after April 1, '55, the date set for vacating by the present occupants. Shell Development now employs 1300, has an annual budget well over $10 million.

•

Field Study: Professors from 14 Midwest universities were recent guests at the Whiting, Ind., research laboratories of Standard Oil Company (Indiana). The one-day session was sponsored by the Diesel Engine Manufacturers Assn., which includes as members 17 large makers of diesel engines 35 parts manufacturers, and seven oil companies. Purpose: to acquaint college teachers with new industry developments. Sample topics covered in the conference: lubricating oil additives; petroleum refining and product quality control; and the effect of fuel composition on engine deposits and wear.

•

Paper News: Newly disclosed experiments at the University of Florida's (Gainesville) pulp and paper laboratory indicate that paper made from bagasse fiber has a 20% edge in tensile strength and 10% more bursting strength than pine-kraft paper. However, it has less than half the latter's tear strength. According to the laboratory's W. J. Nolan, pulps of papermaking grade can be made from bagasse, although these are not recommended for newsprint. Other university findings: a new method for depithing bagasse resulting in 70-80% recovery of the clean fiber; low in lignin content. bagasse pulp requires only 3-4% chlorine for bleaching.

•

Construction Surge: Ten new industrial research and service laboratories, costing more than $12 million, have recently been completed or are now being built by the Du Pont Co. (Wilmington, Del.). Largest of these is the $5-million textile research lab recently opened at Chestnut Run, where emphasis is on customer service via fiber and fabric characterization, construction and performance of fabrics, finishing and dyeing methods. Runner-up is a $3-million lab for the Polychemicals Dept., aimed at sales and engineering services to customers in the plastics industry. It is now partially occupied and is due for completion within the next few months.

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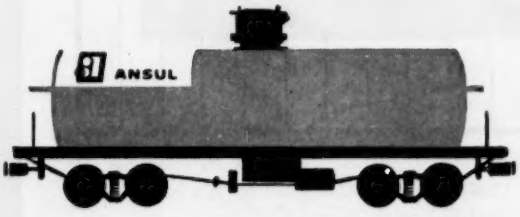
sulfur dioxide



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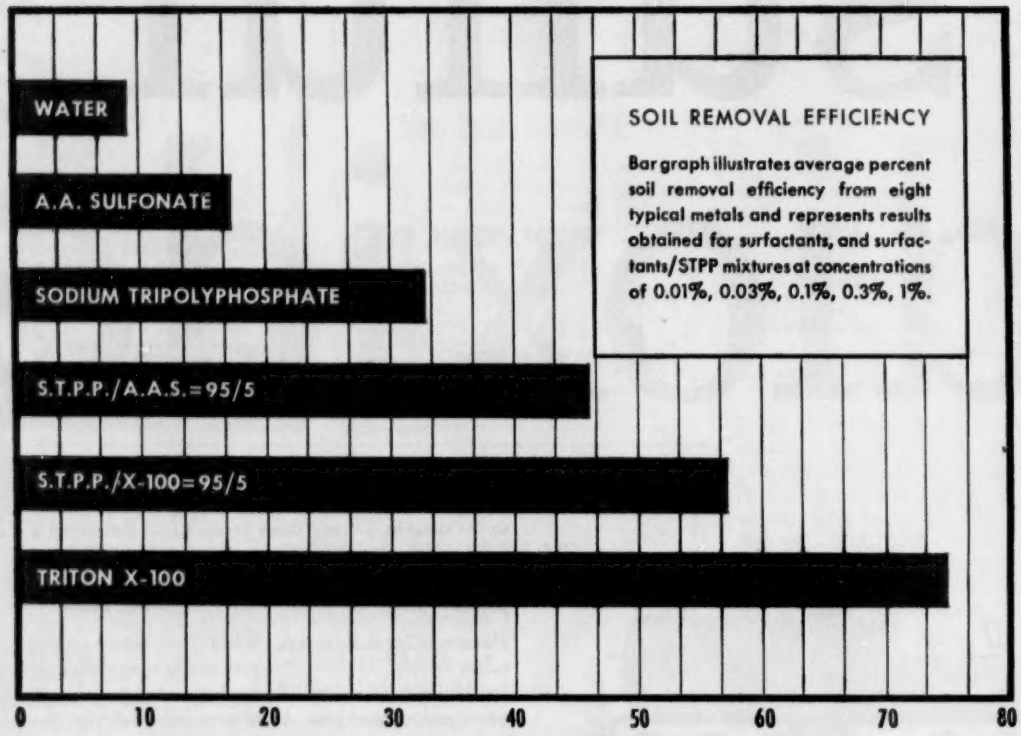

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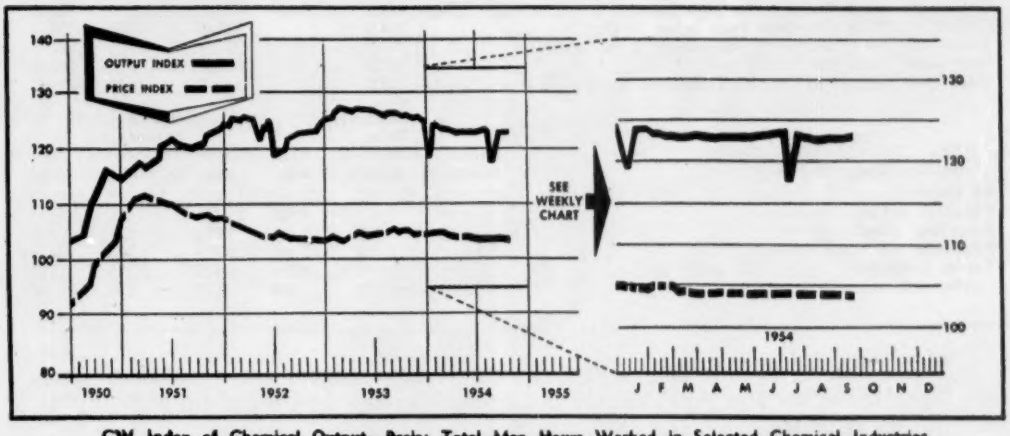


CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

Pharmaceutical-grade methionine late last week followed the same price-cut path trod earlier by the poultry feed supplement material. The latest market break—indicated here as a strong possibility *(CW Market Letter, Oct. 16)*—established high-purity methionine at levels $1 to $1.50/lb. lower than before. For example, 50-lb lots (or more) now sell for $3.50/lb.—a $1.05 drop from the old $4.55.

The reductions generally point up the current imbalance of supply and demand. The slackening, in turn, may explain one major drug company's cautious sizing up the advisability of its entering methionine production, which would round out an otherwise full line of animal feed supplements.

•

On the upswing, however, are polyester resin prices. As of last Friday, Reichhold Chemical's line of general-purpose polyesters were upped 1¢/lb. from the former 34¢ level. None of the other major sellers has as yet emulated the pace-setter.

Although few followed Reichhold's lead when it increased shell molding phenolic resin tags a couple of weeks ago, chances are better that Reichhold may be setting a new industry standard on the polyesters. Reason is economically grounded on two counts: all polyester makers have been hit by the same cost-swelling factors (raw material, freight, labor); perking fall business is probably brisk enough to stand a slight raise in price.

•

"No increase in price" may be part of Shell's campaign when it starts adding TCP to its regular gasoline. That's in contrast with the half-cent hike when the additive was squirted into its premium brand last year. The company has been test-marketing the regular addition in some 15 local areas, but plans eventual national distribution.

You can bet the move will spark a new trend as other gas sellers hop on the ballyhoo bandwagon.

•

The International Tin Agreement quietly moves ahead toward effective operation, probably in the early months of the new year. Though

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	123.6	123.5	126.2
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.5	104.3	104.9
Bituminous Coal Production (daily average, 1,000 tons)	1,375.0	1,332.0	1,542.0
Steel Ingot Production (1,000 tons)	1,755.0 (est.)	1,735.0 (act.)	2,142.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	330.8	340.8	251.0

MONTHLY INDICATORS—Trade (Million Dollars)	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	$23,651	$24,055	$25,067	$43,878	$44,194	$46,888
Chemicals and allied products	1,678	1,675	1,608	3,156	3,146	3,142
Paper and allied products	763	753	735	1,016	1,021	1,024
Petroleum and coal products	2,060	2,134	2,081	2,779	2,790	2,744
Textile products	1,044	1,040	1,098	2,375	2,376	2,646
Leather and products	353	377	264	577	580	562

only Canada to date has ratified the agreement, chances are a sufficient number of the signing countries will approve setting up a world tin buffer stock (*CW Market Letter, July 10*).

The Malayan Tin Bureau points out that the agreement will become effective at about the same time that long-term contracts between the U. S. and Indonesia expire. The latter, of course, are absorbing the current world surplus of tin.

These pertiment first-half data are also noted: the annual rate of tin output for '54 (based on the first six months) is running at about 155,000 tons, compared with consumption of 135,000 tons last year. Thus oversupply tallies to at least 20,000 tons—perhaps as much as 23,000. The U. S. stockpile, however, is expected to take, at the outside, some 28,000 tons; in other words, explains the bureau, this country will have taken "some 5000 tons (of tin) over and above the present surplus of production over normal consumption."

•

Greater upcoming supply may be one factor behind this week's lower urea prices. Most major makers now in production will—if they haven't already done so—go along with Allied's Nitrogen Division's $10/ton cut. Others (for example, Deere & Co. at Pryor, Okla., and W. R. Grace, Woodstock, Tenn.) soon due on a commercial scale, will probably also have to start peddling at the reduced tag.

Underscoring the urea surge: By Jan. of the new year Grace will begin turning out both agricultural and industrial grades of urea at an impressive 60,000 tons/year clip. (Incidentally, the company will wet its ammonia pipes a month or so earlier. Capacity: 72,000 tons/year.)

Lower-priced urea imports, too, are reportedly having some adverse effects on domestic sales, but expectations are that the reductions here—which brings prices down to $110/ton (c.l., f.o.b., works)—should have a desired influence on the market.

•

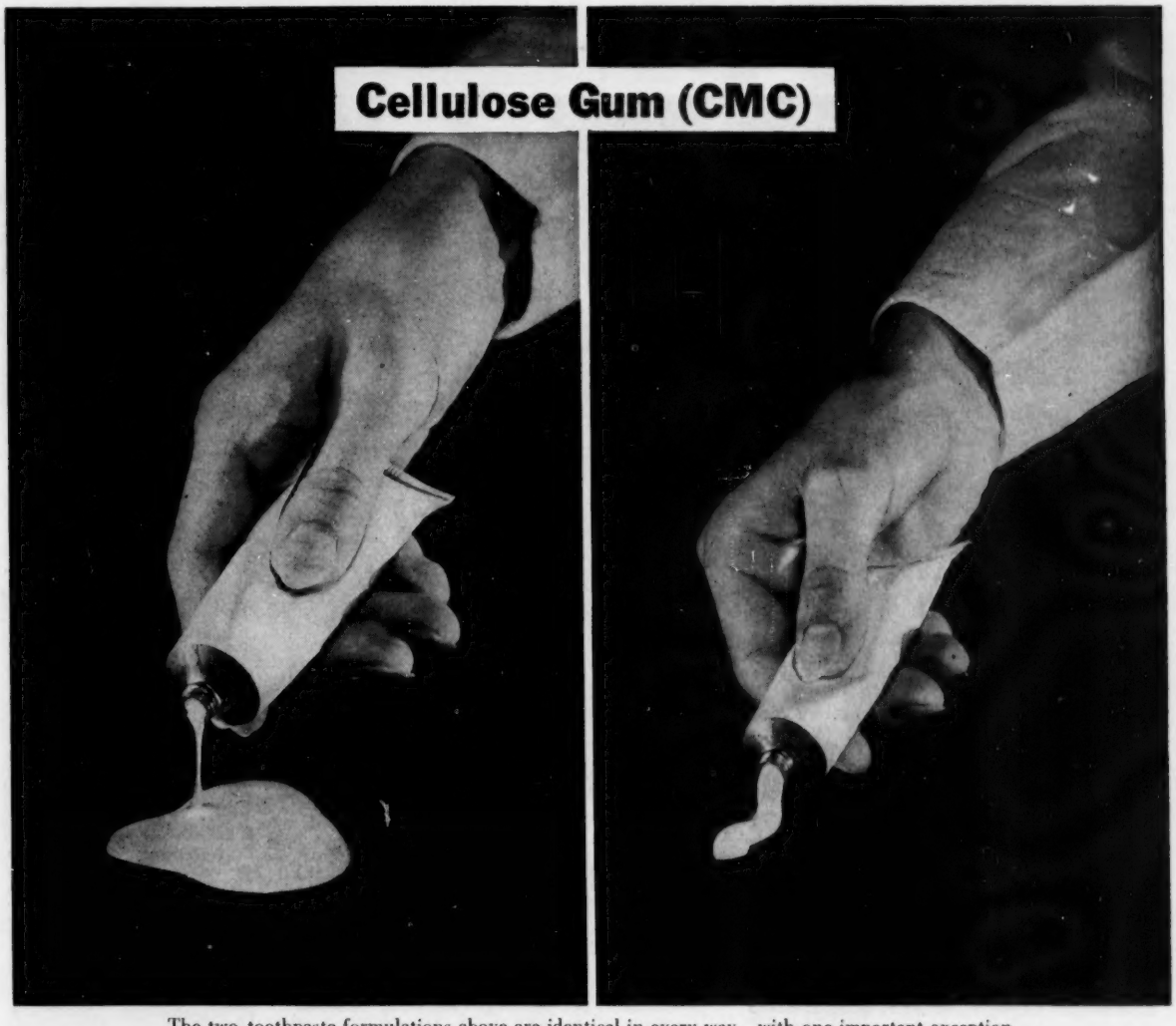
ODM, over the weekend, authorized release of 17,500 tons of government-owned copper to private industry. The market-easing action—urged by strapped users (because of the recent copper strikes)—is a welcome reversal of Washington's stand a couple of weeks ago.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending October 18, 1954

DOWN

	Change	New Price		Change	New Price
Urea, c.l., f.o.b. works, ton	$10.00	$110.00	Methionine, pharm. grade, 50-lb. lots	1.05	3.50
Manganese sulfate, 70%, c.l., f.o.b., dest., E. of Miss., ton	15.00	65.00			

All prices per pound unless quantity is stated.



The two toothpaste formulations above are identical in every way—with one important exception. The one on the right contains cellulose gum (purified Hercules® CMC).

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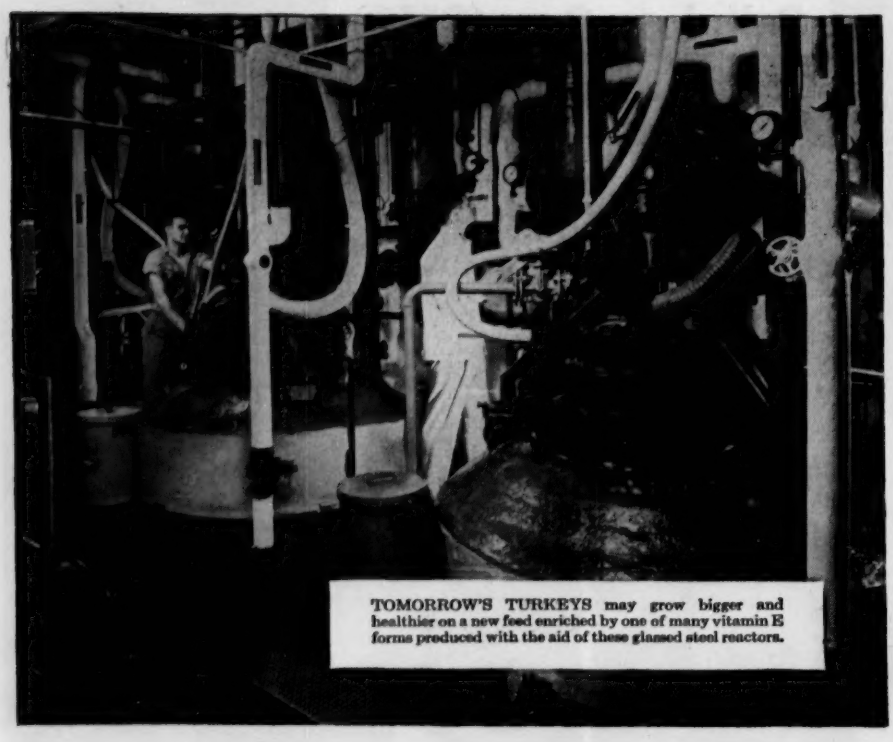
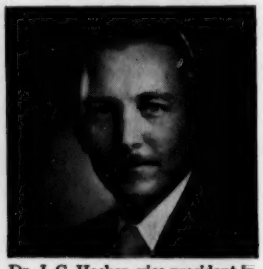
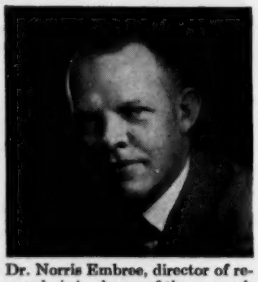


TOMORROW'S TURKEYS may grow bigger and healthier on a new feed enriched by one of many vitamin E forms produced with the aid of these glassed steel reactors.

Raymond W. Albright became general manager of Distillation Products Industries in 1944 after a quarter of a century in the rubber industry. Pioneering in the field of utilizing latex in the manufacture of rubber products, he has had broad experience with chemical production plants and equipment.



Dr. J. C. Hecker, vice president in charge of technical operations of Distillation Products Industries, has a versatile background in research, engineering and production. He has followed most all of DPi's products through the pilot plant and to successful commercial operations.



Dr. Norris Embree, director of research, is in charge of the research and development laboratories; the members of his scientific staff are experts on fats and fat soluble vitamins. Assisting production operations is as much their function as developing new products.

How fast-stepping DPi task force keeps vitamin E from getting old fashioned

You might think vitamin E is vitamin E and that's all there is to it.

But we know a company that makes vitamin E in more different forms than you can shake a slide rule at. What's good for your vitamin capsule may not be at all suitable for a poultry feed supplement.

Requirements for vitamins in pharmaceuticals, foods and feeds are constantly changing. The maker of vitamin E has to hustle to keep pace. In Rochester there's a division of Eastman Kodak Company called Distillation Products Industries that's made history in developing and producing vitamin A, vitamin E and distilled monoglycerides.

Fast Teamwork

DPi has solved the problem of supplying the rapidly changing needs of vitamin E users by using a task force of research and production people who can whip out the right answer and have a bulk shipment of your new vitamin E variety on their shipping platform quicker than you can say "d-α-Tocopheryl acid succinate."

To produce a really *pure* vitamin E, the final stage in DPi's process demands the protection of Pfaudler glassed steel reaction kettles. Here you have the corrosion resistance of glass backed up by the brute strength of steel. Pfaudler alkali-acid resisting glass shrugs off chemical attack by all acids except hydrofluoric, and alkalies as high as pH 12.

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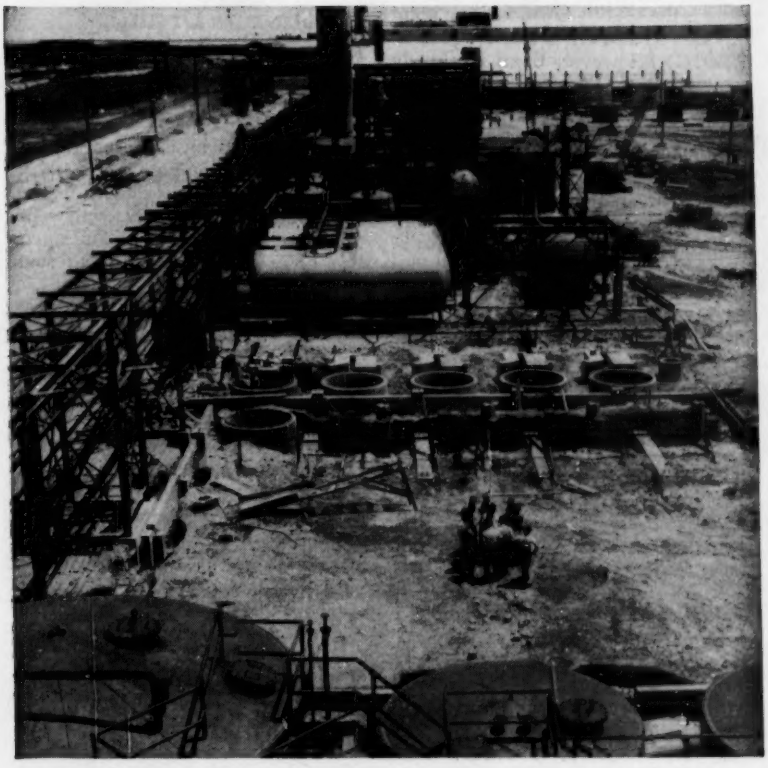
FACTORIES AT: Rochester, N. Y. and Elyria, Ohio, U.S.A.; Leven, Fife, Scotland; Schwetzingen-Baden, Germany



GOING UP: From National Aniline's caprolactam plant, 20 million lbs. of nylon 6.

Caprolactam Tally: 6 vs 66

The first major tonnage output of caprolactam in the U.S. will pour forth in a few weeks, may well set off a rip-roaring scuffle among present and newcomer nylon producers. Involved are the older-line nylon 66,* and the newer (in this country) nylon 6, or Perlon type.

The caprolactam flood is expected to begin in a few weeks when Allied Chemical's National Aniline Division's near-ready monomer plant at Hopewell, Va., comes in. Outturn of caprolactam, in heavy-chemical quantities, will provide, too, a hardy boost to the German-developed nylon's fortune.

For National also has under way, a few miles from Hopewell, a nylon 6 polymerizing and yarn-spinning plant at Chesterfield. By the time the latter plant begins operating with the Hopewell monomer, the company expects to be producing all of its caprolactam requirements, with tonnage left over.†

The Chesterfield installation, slated to be completed in the next few months, should be trickling nylon 6 by early next year. The plant will eventually be producing 20-22 million lbs. of the newer-type filament, staple, or tow. (Underscoring the company's confidence in its products: an impressive $28.5-million investment at the two plant sites.)

But National isn't making its caprolactam plans dependent on its sales of nylon 6, has in fact already signed American Enka and Industrial Rayon to long contracts for some of its caprolactam monomer output. Besides, the Hopewell plant will also produce adipic acid, which will underpin its sister's (Barrett Div.) entry into adipate plasticizers next year. (The question was posed whether National Aniline would turn out nylon 66 with its own adipic acid as a major raw material. The answer at the present time is "No.")

And to reduce net production costs of caprolactam National Aniline may be expected to sell by-product ammonium sulfate (5 lbs. of the sulfate are produced with each pound of caprolactam) to fertilizer mixers through Allied's Nitrogen Div.

National Aniline's upcoming venture doesn't mark the first nibble on the caprolactam production pie in this country. At least two firms have already preceded National in commercial—albeit small—production of caprolactam:

- Du Pont does manufacture caprolactam for relatively small sales as well as for captive use in the manufacture of fishing leaders and monofilament fishing lines. At present, however, Du Pont is not producing nylon 6 for textile fibers or for molding powders.
- Olin Mathieson Chemical turned out small amounts of caprolactam earlier this year from its pilot plant at Morgantown, W. Va. But production was braked to a standstill for process changes, which will probably keep the company out of the market until mid-'55.

Although not a caprolactam producer, American Enka took the wraps off its commercial nylon 6 staple fiber at Enka, N.C., this spring.

American Enka's know-how, of course, stems from its close connection with Algemene Kunstzijde Unie, N.V. at Arnhem and Emmen in the production of Enkalon, also a nylon 6 polyamide fiber. The association, however, does not extend to the Dutch firm's supplying American Enka with caprolactam. Reason: Algemene, no producer, also shops for its caprolactam need.

American Enka depends on imports of West German caprolactam, relative dribbles from National Aniline's Morristown, N.J., research labs, and on intermittent shipments from Olin Mathieson.

Thus, with caprolactam long in meager supply, this question pops up: Why the sudden U.S. attention this year? The interest-kindling fuse was lighted a few months ago—in February—when Du Pont's product patents covering condensation polymers (including the polyamides) expired. That was the door-opener for eager-beavers trying to devise new processes for the manufacture of nylon 6. (Du Pont still holds a good patent position on its own processes of manufacturing this polyamide.)

At about the same time that the Du Pont product patents expired and American Enka began turning out some nylon 6, Industrial Rayon Corp. came up with successful pilot-plant operations. Shift into commercial nylon 6 production at Covington, Va., will likely occur in the next month or two. Full capacity expectation: about 6 million lbs./year.

Although Industrial Rayon, Amer-

* Nylon 6 results from the polymerization of caprolacamt whereas nplon 66 (the Du Pont nylon) is the polymeric condensation of adipic acid and hexamethylene diamine.

† At the same time Allied Chemical & Dye sets up this expense-cutting integration, National Aniline will draw its phenol from the Barrett Div.; its hydrogen and ammonia from the Nitrogen Div., and sulfuric acid from the General Chemical Div.

ican Enka, and National Aniline have depended for the most part on West German caprolactam to keep their pilot-plant operations running, there has been a heavy cloak of secrecy surrounding the names of specific importers or manufacturers, whether domestic or foreign.

Recent shipments are believed to have come from Badische Anilin- & Soda-Fabrik (Ludwigshafen); from Farbenfabriken Bayer (Leverskusen), and Huels Chemische Werke (Marl Recklingshausen). In this country Metachem, Inc., and Nova Chemical Corp. (both in New York) are major importers handling this nylon 6 raw material.

Total imports of 283,117 lbs. of caprolactam entered the U.S. last year, and a mere trickle of 19,195 lbs. in 1952.

With caprolactam from either foreign or domestic sources, nylon 6 makers expect the fiber to attain, in this country, the stature of a commercial man-made fiber next year. Meanwhile, U.S. producers are scanning these production estimates for the Perlon-type nylon: West German production of Perlon has currently surged to between 16-20 million lbs./year, from about 12 million lbs. last year and 8 million lbs. in 1952.

Observing this growth of Perlon in Germany, where competition from nylon 66 is relatively small, market observers in the U.S. may well wonder how domestic nylon 6 will buck the well-entrenched position of the former type. Trade opinion gives a competitive edge to nylon 6 over the conventional type on these points:

- Type 6 nylon, it is generally agreed, has greater affinity for the dyes currently being used for nylon products. It dyes faster, and that means greater economy. It dyes a deeper and truer shade; that can give a finished product of higher quality.
- Some fiber companies aver that nylon 6 abrasion resistance may be 20% greater than that of nylon 66 in some end uses. This difference can help to boost use of the caprolactam polymer in carpets and rugs, tire cord, filter fabrics, work clothes, etc.
- Quite a few textile marketers may be able to translate the softness and pliability of nylon 6 fibers into a more pleasing hand in the finished fabric.
- At least one company says that its nylon 6 will have a slightly higher moisture regain or uptake than the standard-type 66. That characteristic may well mean slightly less "clamminess" in the fabric used by the ultimate consumer.

Among the unfavorable characteristics is the slightly lower melting point of nylon 6 (220 C) vs that of nylon 66 (250 C). However, there is already some evidence that both nylons have just about the same strength degradation.

Nonfiber Nylon: Less definite than nylon 6 fiber output goals, however, are plans to build markets for plastic molding powders of this kind of nylon.

Du Pont has experimented with the production of various nylon molding powders, but has almost exclusively used type 66 for its commercial nylon molding and injection powders. Last year, output was in the vicinity of 12-15 million lbs. (*CW, Aug. 21, p. 92*).

On the other hand, National Aniline, already exploring applications of nylon 6, may eventually cut into some of nylon 66's territory when it comes to these molding powder requirements: high abrasion resistance, extreme toughness, resistance to wear (where there is lack of lubrication). Both kinds of nylon may join ranks in angling for some markets that might go to polytetrafluoroethylene (Teflon) and polytrifluoromonochloroethylene (Kel F). Of course, the fluorinated hydrocarbons get the nod of preference when it comes to chemical inertness, resistance to moisture, and nonoxidizability.

Whether it's plastics or textile consumption, it's anyone's guess as to next year's U.S. output of nylon 6. Reason: U.S. makers have not yet sized up consumer requirements. Furthermore, they will sidle up to this formidable in-place nylon 66 capacity: over 150-million-lb. annual output by Du Pont (Seaford, Del., Chattanooga, Tenn., and Martinsville, Va.), and 50 million lbs. from Chemstrand (Pensacola, Fla.).

Still on the outskirts of major commercial production are the A. L. Erlanger Co., Inc. (Scranton, Pa.), which has made some nylon 66 hosiery yarn, and Dawburn Bros., Inc. (Waynesboro, Va.), which has extruded heavy monofilaments under license with Du Pont. Another potential market entrant yet to be heard from is North American Rayon, a subsidiary of Beaunit Mills, which has been experimenting with various nylons at Elizabethton, Tenn.

While all of these firms make ready for next year's nylon output, chemical marketers will watch nylon 6 battle for a place in what has been up to now a nylon 66 world in the U.S. National Aniline, for one, however, doesn't plan a hard sales push for its caprolactam polymer—will skirt pitfalls of having an overpromoted fiber on the market. But incoming makers are confident a fiber as successful as Perlon in Europe will succeed in the U.S.

Chemical Draught

Chemical sales, glued to the plywood industry on the West Coast, are back to normal this week. Reason: recent settlement of the plywood strikes that have hampered business for both industries during the past few months.*

The interrelation is closely defined by a chemical-consuming, plywood-producing ratio: each million square feet of exterior plywood takes some 25,000 lbs. of formalin, 12,500 lbs. of phenol, and about 3000 lbs. of caustic soda.

Somewhat under this take per million square feet are the chemical requirements of interior plywood using extended resins. This type accounts for some 15% of the total plywood output per year, consumes approximately 14,000 lbs. of formalin, 7000 lbs. of phenol and about a ton of caustic.

Interior plywood with protein glue, made in a hot press and accounting for 35% of total plywood output, soaks up about 20,000 lbs./million sq. ft. of dry adhesives—principally soya meal and blood—700 lbs. trisodium phosphate, plus 400 lbs. of pine oil.

However, when a cold press is used —as is the case with nearly a quarter of the plywood turned out—chemical sales are pushed slightly higher: dry adhesive consumption rises to about 27,000-30,000 lbs./million sq. ft., and the amounts of trisodium phosphate and pine oil are increased by a third.

With their eyes on a widening market, chemical companies are noting, with some enthusiasm, various promotion plans of fir plywood manufacturers. The latter, saddled with a capacity that has almost doubled in the past three years (*see table*) are hard-pushing sales via a number of gimmicks.

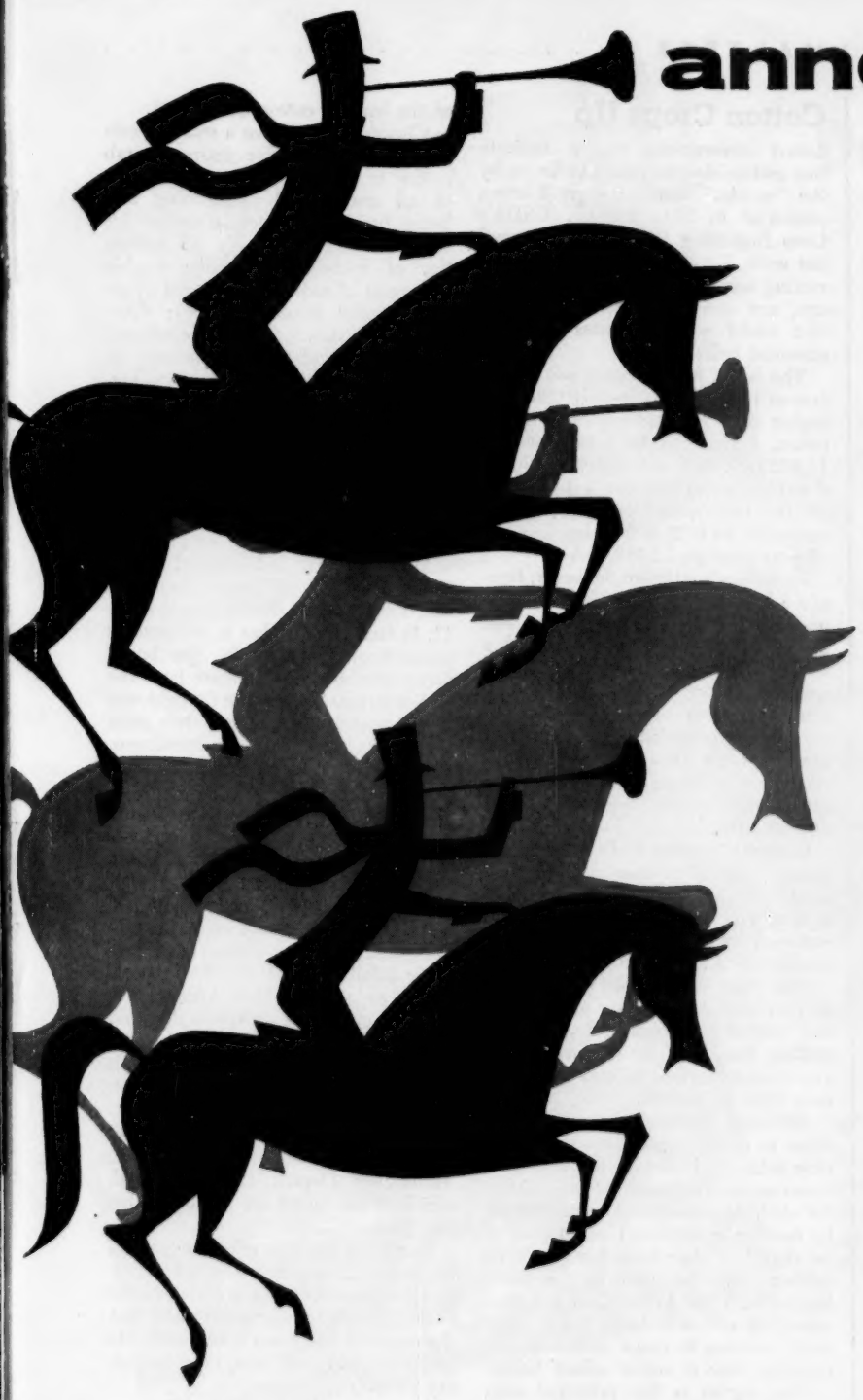
Douglas Fir Plywood Production

	(million sq. ft.)
1952	2,765**
1953	3,245**
1954	3,500 (est.)

(No industrywide figures are available however, on the production of hardwood plywood, though trade sources look forward to possible compilation of these data within a year or two.)

Meanwhile, by linking the fir plywood production figures with chemical consumption, chemical sellers see exterior plywood alone drinking up a hefty draught of 35 million lbs. of chemicals this year, and interior fir plywood, using extended resins, absorbing some 12 million lbs.

* AFL mills were out 12 weeks; CIO mills, 14 weeks; both strikes began June 21.
** Data based on a year's operations of 51 weeks.



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Cotton Crops Up

Latest government reports indicate that cotton—despite rough buffeting by the "wonder" materials—is still being produced in lusty fashion. USDA's Crop Reporting Board figures issued last week, for instance, show that harvesting estimates made only a month ago, are now being raised 6%—and that could mean brighter days for chemical sellers.

The latest forecast pegs the cotton crop at 12,511,000 bales, 679,000 bales higher than the government's expectation, announced in September, of 11,832,000. And although it is almost 4 million under last year's crop (16,465,000 bales), the October prognostication for '54 is 23,000 higher than the 10-year average, 12,488,000.

September's estimate, however, foresaw a baleful drop of 169,000 from the previous month's (August) figure, and a few in the trade had expected a further reduction. Official weekly weather reports during the month, combined with other factors, influenced the pessimistic thinking that crops were in for a further deterioration; thus the sharp jump in the crop estimate this month came as somewhat of a surprise.

Cotton Chemical Calls: But if the promise of a greater cotton yield caught some trade followers off base, it may well have cheered others. For cotton—from the planting to finished product—is a top chemical consumer.

This year, for example, the quantity of prepared cotton dusts used in the boll weevil area could hit a near-85 million lbs. That would match last year's consumption, tally to some 20% over '52's 70 million.

Although synthetic organics continue to make inroads into the fungicide field, the higher cotton crop may mean an end to the recent ground sulfur skid. Application of sulfur (either by itself or in mixtures) may equal, or be slightly higher than, last year's 70 million lbs. That isn't in the same league with the 110 million lbs. consumed by cotton in 1951, but any upward revision in crops means a concomitant hike in sulfur sellers' hopes.

Too, cotton is the principal crop that is chemically defoliated. That the market is growing is pointed up by a casual glance to the number of acres being deleafed. In 1946, there was practically no cotton defoliation. Four years later more than 1.5 million acres were being treated; by the next year the area covered doubled. This year the number of acres chemically defoliated may come close to 4 million. That presages an outlet for some 3-4 million lbs. of sodium chlorates (one of the leading cotton defoliants).

Chemicals also have a stake in cotton processing. Some estimates tab cotton as accounting for almost 70% of all fibers used in clothing and home furnishings—specific outlets for bleaches (e.g., probably 45 million lbs. of hydrogen peroxide; sizable quantities of sodium or calcium hypochlorite and liquid chlorine); dyes; textile finishes (water repellants, mildew preventatives, chemicals to aid resistance to crushing, wrinkling, shrinking, spotting, etc.).

Where From: Fertilizer marketers, of course, are evincing interest in the Crop Reporting Board's data on cotton harvesting areas—it's a good indication of where the best potential customers are.

Most Eastern and Central cotton states show harvestings at record or near-record levels during last month—11, in fact, report hikes in prospective production. (Incidentally, the board partly attributes the increase from the earlier forecast—when the drought was at its peak—to mid-September rains and breaks in the searing temperatures. Field losses of open cotton, it adds, have been slight.)

Texas led the field with an estimated gain of 200,000 bales. Rates for some of the others: Mississippi, 175,000; Georgia, 80,000; Arkansas, 60,000; Alabama, 50,000; Louisiana, 35,000 bales. Oklahoma, Tennessee, Missouri, California (which currently chemically defoliates more than half its cotton acreage), and New Mexico also reported gains, but prospects declined in North Carolina by 35,000 bales.

Near-record percentages of the bolls are already open, the board points out, with 46% of the crop ginned by Oct. 1.

The new forecast of 12,511,000 bales is running slightly ahead of U.S. Agriculture Dept.'s 12-million goal, which is the target set to hold down surpluses.

One chief consideration in predicting eventual crop levels is the condition (appearance) of the cotton in the fields, though some experts hold that the reported condition is an unreliable guide to yield prospects, especially in dry years.

At any rate, the Oct. 1 condition, according to the reporting board, is estimated at 71% of normal. That compares with 77% in 1953, and the 10-year average of 72%.

There's no way of accurately telling now whether subsequent information out of Washington will again alter the expected level of cotton output, but it's a cinch that the chemical industry will note the figures as avidly as cotton traders.

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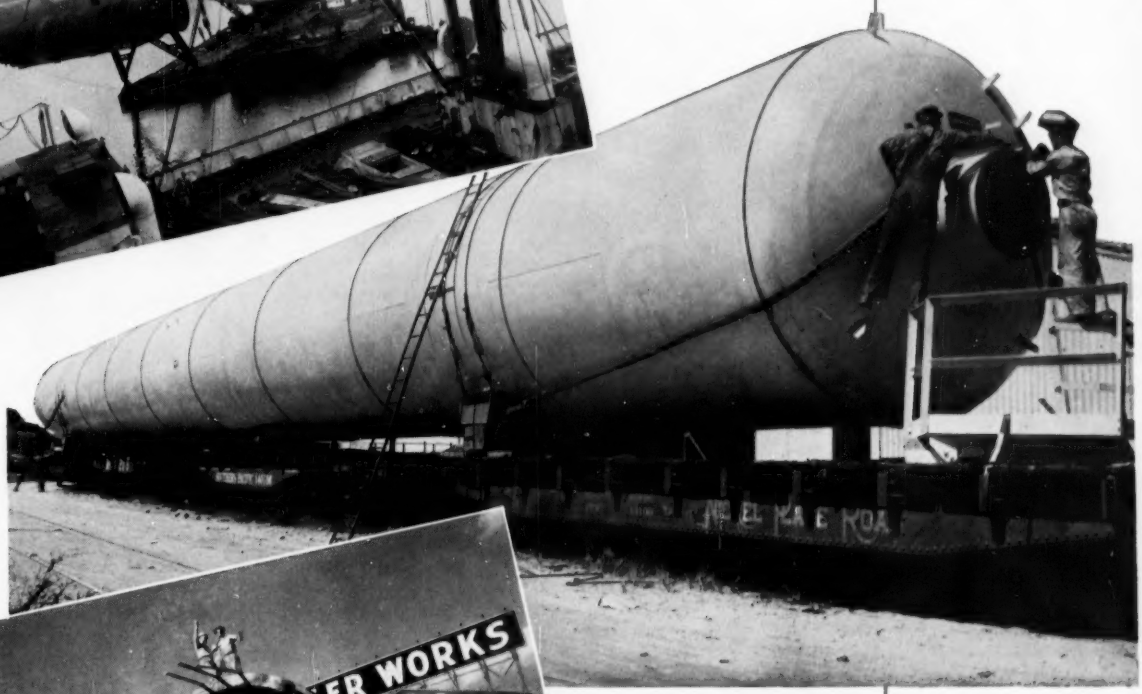

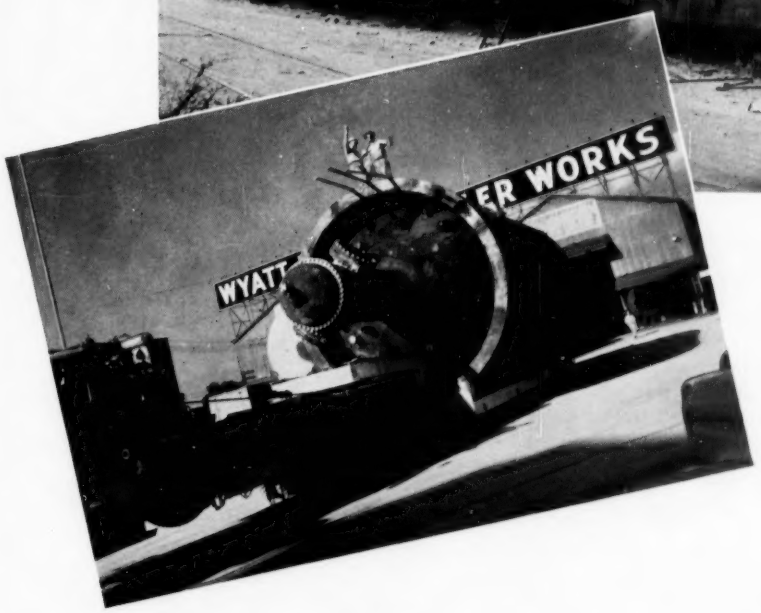

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CATCHING every word, these 300 salesmen took in SAACI's third sales clinic.

Clinic Now, Sales Next?

On the speaker's podium in the East Ballroom of New York's Hotel Commodore last week, several of the chemical industry's top sales executives leaned forward from their chairs attentively. In front of them were 300 chemical salespeople. For more than one solid hour, the audience, from the newest "cub" to the veteran sales manager, sought from these authorities answers to the problems vexing their daily sales. Providing stimulus for the queries was the day-long Third Chemical Sales Clinic of the Salesmen's Assn. of the American Chemical Industry, Oct. 11.

Squeezing time from their call-heavy schedules, the salesmen heard the experts come to grips with the essentials of what it takes in "Selling Chemicals Today." One of them pointed the way to hone the tools of selling; a second sketched the fundamentals of a self-training program; a purchasing agent limned the "sins" of a salesman. Additionally, the sellers were alerted to the full potential of their position and were reminded of basic character traits that salesmen, to be salesmen, must develop.

Tool Chest for Sales: The salesman has several basic aids to help him perform his tasks. But even the most effective is worthless unless correctly applied. Outlining four fundamental selling tools, Ray Dinsmore, vice-president of Goodyear Tire and Rubber Co., pinpointed their use this way:

• Market knowledge. As the market for many chemicals is rarely static, the customer insists on learning about such things as demand changes, supply, and inroads of competitive products. "A sound analysis of the situation and trends is one . . . logical approach to the customer's interest."

• Technical information. Knowledge of "the product's commercial background is a sales tool that can, more quickly than anything else, establish a basis of mutual interest with the customer." The technical brochure can help supply this staging. It should, asserts Dinsmore, not only furnish the technical man detailed data, but also should present the essential facts in readable language to the nontechnical or too-busy reader. By observing the prospect's reactions when flipping through a copy of the booklet, the salesman can quickly spot the customer's interests. And at the salesman's finger tips, too, should be such information as company and industry production, consumption and raw material supply trends.

• Technical service. Although expensive, the service lab is one of the most useful selling tools. Properly handled it can build an "important degree of customer goodwill." Proper handling, however, isn't reflected in "long service delays" or in forcing demonstrations onto the customer. Understanding the prospect, his methods and preferences assists in cultivating customer goodwill.

• Personality. Perhaps most valuable of all selling tools are the salesman's personal characteristics. Included here—besides personality, appearance and energy—are the abilities to receive and impart data, and intuitive appraisal of the customer's state of mind. The purchasing agent's "impression of the salesman's willingness and ability to work with him are factors in the success of an initial approach."

Self-training and Sales: Effective use of the tools of selling obviously demand training. After novice days are over the training burden falls on the salesman. It's up to him to train himself. It's the opinion of J. S. "Dave" Crockett, sales training director of Minnesota Mining and Mfg. Co., that self-education calls for a continuous review of the fundamentals of selling:

• Attitude: According to Crockett, it's the "way you feel about the company, job, contacts, and the like. Self-respect is a part—a salesman must have it to win respect of the customer." For a healthy attitude "you must believe in your products . . . and you must want the customer to believe in them." And above all, the attitude must be enthusiastic. But to be infectious, it must be sincere.

• Over-all knowledge. "Technical people find it a pleasure to talk with salesmen who know what he's talking about." A periodic sales appraisal with the sales manager to broaden fact-familiarity and to acquire new application ideas can, believes Crockett, impart some of this knowledge. But, only the salesman himself can know, "Do I have a favorite product to sell?"

• Work habits. Self-training to be effective must reach the salesman's personal *modus operandi*. One salesman cited for emulation by 3-M's sales training boss organized such pre- and post-call check questions as, "What is my interview objective?" and, "Did I use my tools effectively, respond to observations?" This same salesman methodically planned work schedules and on weekends double-checked every thing—from car cleanliness to samples in the satchel.

• Selling skills. "What you do face-to-face with your customer is your selling skill." In the 120 minutes a day spent with prospects, 15-20,000 words are used. Choice of language directly influences sales. It follows, too, that the salesman should think in terms of what information different depart-

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(part answer, part ballyhoo)

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CACHALOT is the registered trade name for a large line of aliphatic, long chain, normal alcohols. They look like waxes and oils but they have the outlook of alcohols. Technical, NF, and USP grades are vacuum-distilled to tight specifications. Hydroxyl values and iodine numbers, for example, are held to close tolerances. The resultant lot-to-lot uniformity keeps users quite happy.

To make sure that the product you get is whistle-clean, special care is taken in packaging CACHALOT. Solid alcohols (such as cetyl and stearyl) are flaked, sealed in polyethylene bags, which in turn are sealed in sturdy corrugated cartons. Liquid alcohols (such as oleyl) are shipped in spanking-new drums. Steam-cleaned tank-cars or -wagons take care of bulk deliveries. Nearly thirty years of original research have gone into CACHALOT; today they are, ahem, the standard by which other fatty alcohols are judged.

If you've read this far, thank you. If fatty alcohols look like something you might use in your line, why not write for the booklet "Possibilities"? M. MICHEL AND COMPANY, INC., 90 Broad Street, New York 4, N. Y. are specialists in fatty alcohols, have been so for over a quarter century, and would like your business. For fatty alcohols. In one word:

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HOW-TO: Selling chemicals, say experts,* calls for tools and self-appraisal.

ments want about a product. The purchasing agent needs the facts to prove economy, the researcher the data for claim-verification, and the production man information on supply and shipment.

Trespasses Against Sales: Blocking orders to higher earnings for many a salesman is an array of offenses against purchasers. As George Polzer, purchasing agent for American Cyanamid's chemical raw materials, sees it, the most heinous crime of a salesman is failure to recognize that the buying-selling function is a teamwork proposition. But there are plenty of others. In fact, Polzer listed 15 of them. Some:

- Talking on and on after finishing business.
- Wasting too much time in reaching the point at hand.
- Ingracious acceptance of defeat when the product has no place in the company or if competitive prices can't be met.
- Outright dishonesty.
- The "I-know-vice-president . . ." approach.
- Lack of imagination.
- Failure to speak clearly and distinctly.
- Lack of consideration for subordinate personnel in the buying organization.
- Leaking information (given in confidence) to the competition.
- Inability to temper approach to the individual buyer.
- Excessive entertainment. (Purchasing agents like to spend evenings home, too.)

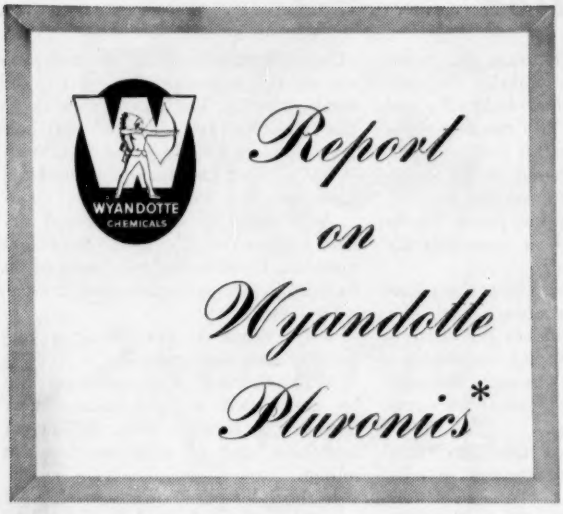
Not one to cast the first stone, Polzer also briefed the meeting on the "sins" of a purchasing agent. Lack of end use knowledge, failure to give the salesman uninterrupted attention, unreasonable service demands, and failure to provide adequate information constitute some of the PA's worst offenses.

Success and P-r-o-f-i-t: Motivation is one of the basic factors influencing a salesman's productivity. And while, believes Ernest Hart, executive vice-president of Food Machinery and Chemical Corp., money is the chief motivator of salesmen, it's one of "low octane." What's needed to boost motivation power, feels Hart, is a full realization by the salesman of the vast opportunity his position can afford.

The salesman has the chance to meet production people, learn about patents and contracts, mix with the advertising and public relations departments meet company executives and sometimes even stockholders. And he has access to learn his customer's business and the many uses of his products. By realization and embracement of the opportunities for knowledge and leadership, the salesman can "move forward to success through selling."

Profit is a word all salesmen should keep in mind. It contains, symbolically, asserts William McConnell, sales vice-president of Diamond-Alkali, reminders of the qualities a salesman should develop. These are: P—pride in the sales profession; R—reasoning ability; O—opportunity recognition (for example: chances to convert negative situations into positive ones); F—fitness, both mental and physical; I—integrity; T—tactful tenacity in

* (l. to r.) Standard Oil's Lovejoy, Food Machinery and Chemical's Hart; Minnesota Mining's Crockett; Diamond Alkali's McConnell; and American Cyanamid's Polzer.



Pluronics' dispersing properties helpful in water treatment

The exceptionally effective dispersing power for calcium and magnesium salts, and the low-foaming characteristics of Wyandotte Pluronics have been found beneficial in boiler-water treatment, as well as in some water-conditioning applications.

Other properties of Pluronics that are valuable in the formulation of water-treating compounds are: their compatibility and stability with acid or alkali solutions over a wide temperature range, and their unusually low order of toxicity.

Commercial usage by major producers of boiler-water compounds has proved the Pluronics to be one of the most valuable recent developments in the industry.

Pluronics improve rinsability in mechanical-dishwashing compounds

The Pluronics have found almost immediate acceptance in the mechanical-dishwashing field. The reasons are easy to understand. Formulators have found that the Pluronics provide a unique combination of desirable properties:

1. An ability to eliminate staining and streaking usually caused by improper rinsing.
2. Exceptionally low-foaming properties.
3. Better, more permanent dedusting effect than other surface-active agents.
4. No increase in the hygroscopicity of the compound.

This combination of vital properties cannot be duplicated in any other single nonionic surfactant. They are giving important sales advantages to many formulators of mechanical-dishwashing compounds. Could the Pluronics do the same for you?

Pluronics control suds level of laundry detergents

The Pluronics — Wyandotte's new series of 100%-active nonionic surface-active agents — have proved their value in laundry detergents. Large-scale formulators are using one or more of the Pluronics in their newly introduced compounds. They find that the overall balance of the desirable properties, listed below, make the Pluronics the most versatile agents of their type available today.

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4. Compatibility with a wide variety of materials.
5. High detergency.
6. Permanent dedusting effect and no moisture pickup.

The inherent flexibility of the series makes it easy to formulate compounds with optimum characteristics — suds level, detergent power, carbon soil removal and whiteness retention can be easily varied to suit particular requirements. Actual usage in production by well-known formulators, based on extensive testing, may be your tip to beneficial use of the Pluronics in your products, too.

You can probably use the Pluronics profitably, too!

The Pluronics have found many uses — and accounted for substantial savings! — in many fields: viscose rayon and cellophane, metal cleaning and cutting, dye dispersing, boiler descalants, air conditioning systems.

New and unusual applications for the Pluronics are being reported constantly. If you have need for a surfactant, it will pay you to evaluate the Pluronics thoroughly . . . they could well be just what you are looking for to improve your products.

For more information...

We will be happy to send you a data sheet summarizing the physical and surface-active properties of the Pluronics. If you are able to give details of your expected applications, we will supply the proper samples and pertinent information for your evaluation. We're ready to help you in any way we can. Write us today, or call your local Wyandotte representative! *Wyandotte Chemicals Corp., Wyandotte, Michigan. Offices in principal cities.*

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working for an increase in sales.

Quiz-bee: With a full-day of sales-clinicking under their belts, it's not surprising that the 300 meeting-goers had plenty of posers for the experts to answer. Here are some of the questions and answers the session evoked:

• Q. When a supplier has a "black-mark," what's his best approach for regaining confidence?

A. (Polzer) Inquire about the situation, arrange a conference with the purchasing agent, explain the circumstances (but give the PA opportunity for rebuttal), and attempt, through discussion, to seek grounds for overcoming the difficulty.

• Q. How can a salesman train himself if he cannot conduct a self-appraisal?

A. (Crockett) In situations like this, the salesman should prepare a detailed list of his problems and go over it with his sales manager to obtain appraisal.

• Q. What do you think of price as a sales approach?

A. (Hart) The price-only approach isn't favorably received. A good many other factors such as supply and service are also important. Replying to the same question, McConnell took much the same position, indicated that he'd be suspicious of big price cuts.

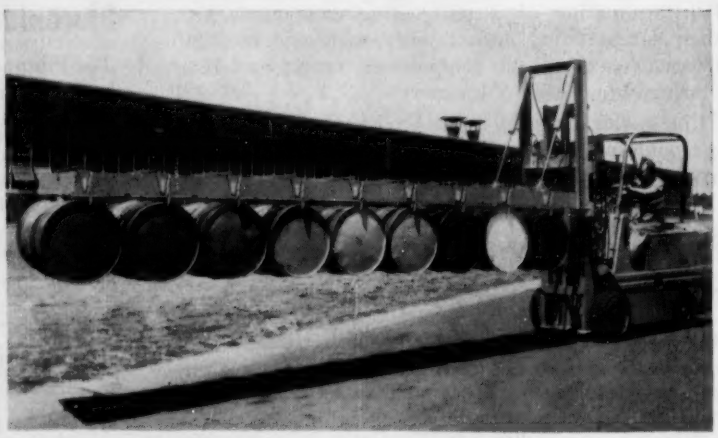
• Q. What are the things most appreciated in a salesman?

A. (Polzer) Honesty, trust and sincerity represent the more important qualities. Confidential treatment of information (for example) is, of course, a big factor.

• Q. What do you think of reciprocity as a selling tool?

A. (McConnell) Reciprocity can not be considered a good selling tool. Eventually, it leads to a dulling of ingenuity and of aggressiveness in selling.

If the sales clinic questions showed one thing, they showed that the subject matter had stimulated thinking. And, that in the considered opinions of industry sales-authorities, selling chemicals today demands that the salesman leave no tool idle, continue his job-education, temper his trespasses, and spur himself along with opportunity.



New Clamps Tighten Cost

TO TAKE the place of man-hours in handling empty chemical drums, here's a development from the Philippines and Philadelphia. A Philippine concern was piling drums with men and ladders when it caught this idea. Yale & Towne developed the attachment to fit its 4000-lb. capacity lift truck and sent it back. It works like this:

• A 224-in. boom with nine sets of hydraulic clamps is lowered on a row of drums; clamps grab nine.

• The drums are carried to the pile site either horizontally or are erected to a near vertical position.

• Drums are stacked by hand against the side of a building until a triangle with a nine-drum hypotenuse is formed.

• The pile is built out with the lift truck. The boom is set at the angle of the pile's slope and a row of drums is laid on by releasing the clamps.

By reversing the procedure, the drums can be broken out of the storage pile.

458

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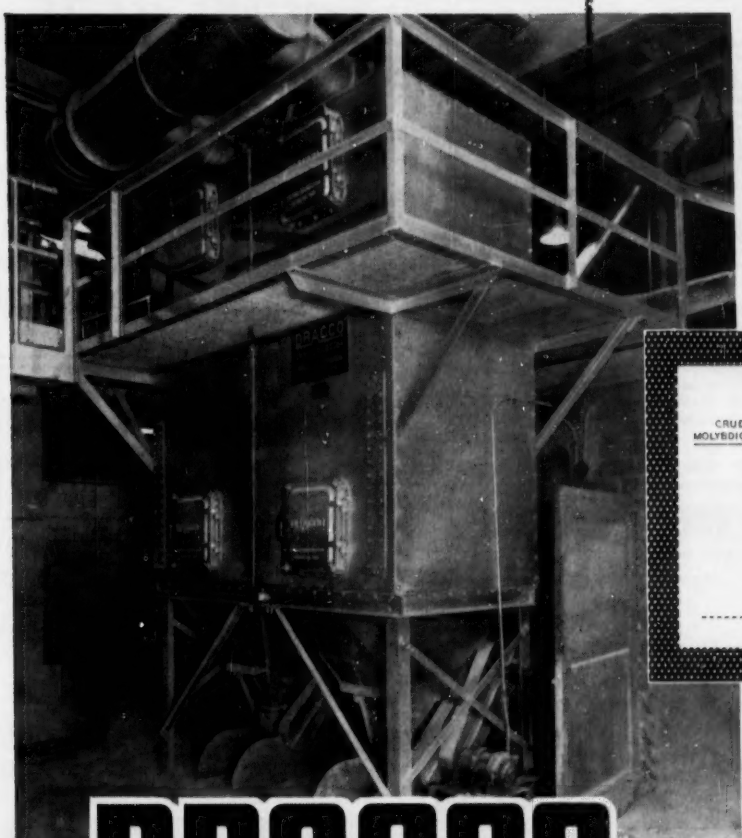
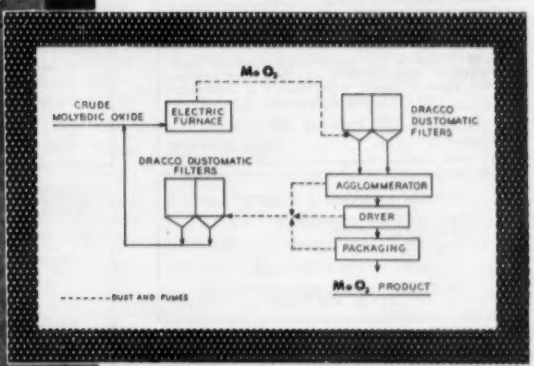


Two large Dracco Dustomatic Filters are integrated with an electric furnace to capture hot MoO_3 fumes released in sublimation of crude molybdic oxide. Dracco Filters (left) eliminate product loss during final processing operations.

Diagram shows how Dracco Dust Control Equipment is integrated with other processing equipment used by Climax in the manufacture of pure molybdenum trioxide.



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GRIFFITH AND DEWEY: Quadrupling comes easy, "questionables" come later.

The Nonrolls Roll On

"Our product may well eliminate one of the continuing sources of marital discord." So summing up one of the claims for his polyethylene tube, last week Bradley Dewey reported on the progress of his 10-month old Bradley Container Corp. (*CW, July 3, p. 36*).

The particular claim for marital bliss to which Dewey alluded is the nonrollability of his new plastic tube. Men, contends Dewey, like to squeeze tubes from the end, roll them methodically: women pay little or no attention to the emptying process, simply squeeze the container at any convenient spot to empty.

Quadruple Squeeze: Right or wrong in his marital generalization, Bradley Dewey adduced facts that indicated his faith in polyethylene collapsible tubes and "squeeze-to-use" bottles is being vindicated. The Maynard, Mass., firm, now turning out its "Bracon" containers at a half million/week rate, plans to quadruple that figure in the coming year.

Restricting itself to foolproof applications, the company is currently manufacturing containers of eleven different diameters and three standards of wall thickness.

Avoiding, for the present, the more difficult to-handle products such as toothpaste with its polyethylene-permeable essences, the company's initial developments are being concentrated in these fields:

• Pharmaceutical. Leading manufacturers are working with Bradley on nasal sprays, one-drop packages for eye and ear solutions, tubes for ophthalmic ointments, bottles for anticeptic powders, rectal dispensers, first aid cream containers and other medicinals.

• Home Use Chemicals. Le Page's, Borden's, Reading Plastics and Acorn Adhesives are working on adhesives and glue tubes. Hercules is releasing a soluble solder packed in a tube. Carter's Ink will soon offer drawing inks and eradicators in "unidrop" tubes. Caulking compounds and other special applications are in the offing.

• Cosmetics. Bath talcum, cream shampoos, permanent wave neutralizers, foundation creams, liquid rouges and many other health and beauty aids are being developed.

• Foods. One-drop liquid saccharine dispensing tubes are being made for three well-known houses. Dropper packages for cake icing coloring are being market-tested, as are others for mustard, mayonnaise, cheese, jellies and other spreads.

The Reasons Why: In discussing steps in his company's progress, Vice-President and General Sales Manager, Henry Griffith, cites several recent developments that are contributing to Bradley's success. In particular, Griffith mentioned:

• Electron beam sterilization. Claiming a "first" in commercial packaging, Bradley's "cold" electron beam sterilizer is being used in the pharmaceutical and food fields. Its 2-million-volt particle accelerator generates a wall penetrating beam, which will sterilize small filled packages, presterilize larger empty containers. (The larger containers are then delivered to food packers in hermetically sealed polyethylene bags.)

• Design and art service. Eager to have its customers take advantage of printing techniques in the design of new packages, Bradley is retaining the Institute of Contemporary Art of Boston as design consultant.

Concerning the plastic tubing of hard-to-crack packaging nuts, Dewey is optimistic. Predicted he, "I think the future looks good for those fellows we can't serve now."

Polystyrene Contest

A major plastics materials maker is now finalizing plans for a design contest for commercial plastic molders. Claiming the competition is the first of its kind in the plastics industry, Koppers Co., Inc., will sponsor the event "to lend active, tangible support to the concepts outlined in the 'statement of principles of the plastics industry' promulgated by the Manufacturing Chemists' Assn."

Aimed at encouraging the upgrading of all plastic products, polystyrene maker Koppers' contest is specifically beamed at encouraging molders of polystyrene housewares items. Products entered in the competition may be molded or extruded of either regular or modified polystyrene and must be designed and produced by the molder for sale as a household item. All molders of polystyrene are eligible, Koppers emphasizes, regardless of whose material they use.

A panel of design, engineering and marketing authorities will judge the entries on the basis of design, quality and imagination. The judges: Raymond Loewy, industrial design consultant; Jesse Day, editor, *Society of Plastics Engineers Journal;* Hugh Wales, marketing professor at the University of Illinois, and secretary of the American Marketing Assn.

Three one-year full-tuition scholarships will top the awards to be made by Koppers to the first prize winners in three competitive product classes. The three categories and examples of them:

• Class I—utilitarian products with operative construction. Example: a vegetable shredder.

• Class II—utilitarian products with nonoperative construction features.

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DISTRIBUTION . . .

Example: a cereal bowl.

• Class III—decorative products. Example: a wall planter.

Koppers is timing its contest for the housewares industry's traditional "new product month" of January. Because all entries must be in by Jan. 30, it is expected that most of them will be on display at the housewares show in Chicago, next Jan. 13-20.

Winners will be announced at an industry banquet to be sponsored by Koppers in Pittsburgh, March 21. The prize products will be merchandised as part of a nationwide promotion directed to housewares buyers.

•

Distributor Appointment: Clarence Morgan, Inc. has been appointed wax sales representative for the Chicago area by Strohmeyer & Arpe Co. (New York).

Lightweight Innovation

PARING the weight of a shipping container is always a good way to whittle freight costs. This time-honored axiom is proving out again as Dow Chemical readies plans next month to introduce a polyethylene-lined fibre drum for iodine shipments. The fibre drum replaces heavy, conventional wooden kegs.

Weighing only 7 lbs., the new container, besides cutting weight and shipping bills, features improved package opening and closing, and reduced possibility of contamination from other materials. And, by using a double polyethylene lining, absorption of the product on the outside container walls is avoided. Dow plans to ship both wet and dry iodine in the new 12½ x 19-in. drums.

Where can you best use B&A Potassium Bifluoride?

In brazing and soldering fluxes?

Potassium Bifluoride is an excellent solvent for removal of metal oxides. Its effectiveness on tough oxides has made it the basis for most silver brazing fluxes and has led to increased use in all types of brazing and soldering fluxes. These fluxes depend for their quality on the high purity of B&A Potassium Bifluoride.

In glass polishing?

Optimum uniformity and freedom from foreign particles are characteristics that make B&A Potassium Bifluoride in demand for high quality glass polishing.

In addition to the above, Potassium Bifluoride has many other uses. Why not investigate it for *your* process? Remember, B&A Potassium Bifluoride is a high purity product assaying over 99% $KF \cdot HF$ and specially formulated for easy handling. It is manufactured with the care and "know-how" that have made Baker & Adamson products the standard of purity in reagent and fine chemicals since 1882.

Experimental quantities and literature on the chemical and physical properties of B&A Potassium Bifluoride are available on written request. And, of course, you can order 100 lb. and 400 lb. drums from any of the Baker & Adamson offices listed below.

In glass etching and frosting?

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